DOCUMENT RESUME

ED 030 247 40 EC 003 983
By-Ferster, C. B.
Treatment and Education of Autistic Children: Combined Application of Clinical and Laboratory Methods. Final Report.
Institute for Behavioral Research, Silver Spring, Md.
Spons Agency-Office of Education (DHEW), Washington, D.C.
Bureau No-BR-5-0402
Pub Date 15 Sep 68
Grant-OEG-32-30-7515-5024
Note-482p.
EDRS Price MF-$2.00 HC-$24.20
Descriptors-*Autism, Behavior Change, Case Studies (Education), Clinical Diagnosis, Early Childhood, *Emotionally Disturbed, Environmental Influences, *Exceptional Child Research, Inservice Education, *Operant Conditioning, Professional Education, Programed Instruction, Reinforcement, Residential Schools, Staff Improvement, Student Evaluation, Teaching Methods, Therapeutic Environment, Training Techniques

The report describes a 3-year project which utilized the techniques of experimental psychology and the principles of operant conditioning to gain in the understanding and treatment of autistic and schizophrenic children. Included are discussions of the autistic child, the project itself, arbitrary and natural reinforcement, the setting and therapeutic procedures, and training procedures and materials used in the clinical training program for staff. Courses in teaching principles of reinforcement and in principles of behavior, both by Fred S. Keller, are provided. The classification and description of the autistic child's behavior are considered, and a clinical, experimental, and behavioral description of a single child is provided. School room experiments are considered, and a clinical description is given of the population included in the study along with an evaluation of the changes in the children in the program. (JD)

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TREATMENT AND EDUCATION OF AUTISTIC CHILDREN: COMBINED APPLICATION OF CLINICAL AND LABORATORY METHODS

September 1968

EC 003 983E

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
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Final Report

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Treatment and Education of Autistic Children: Combined Application of Clinical and Laboratory Methods

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Silver Spring, Maryland

September 15, 1968

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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CHAPTER 1

INTRODUCTION

Three interests, all centering about the schizophrenic and autistic child, have converged to produce this book. First there is the autistic and schizophrenic child, a tragic clinical phenomenon, which has posed so many challenges to therapists and practitioners both clinical and experimental. Second there is the challenge of a profound and paradoxical disturbance in such very young children which has stimulated much research and theoretical work. And finally, there was the Linwood Project focusing on Jeanne Simons and the Linwood Children's Center where effective thereapy was being carried out with these enormously disturbed and difficult children. The report of the Linwood Project, because it touches on so many aspects of etiology, diagnosis and treatment of autism. is a convenient opportunity to bring together in one cover the author's previous theoretical work in this field.

It may be helpful for the reader who is not familiar with some of the clinical and experimental background, to first describe the kind of children which we will be talking about. Those who know the autistic child may want to move on to the second half of the chapter or to Chapter 2.

CHAPTER 1

THE AUTISTIC CHILD

Controversy continues with regard to the differential diagnosis of infantile autism. Even most of the discussions will be about infantile autism, for simplicity of argument, the descriptions of children's behaviors and their parental and therapeutic environments will include schizophrenic as well as autistic children. Kanner's original, now classical, descriptions of the autistic child continues to be a focus for most writers in the field (Kanner, 1943).

> ". . . our children are able to establish and maintain an excellent, purposeful, and 'intelligent' relation to objects that do not threaten to interfere with people, with whom for a long time they do not have any kind of direct affective contact. In dealing with another person becomes inevitable, then a temporary relationship is formed with the person's hand or foot as a definitely detached object, but not with the person himself. All of the children's activities and utterances are governed rigidly and consistently by the powerful desire for aloneness and sameness. Their world must seem to them to be made up of elements that, once they have been experienced in a certain setting or sequence, cannot be tolerated in any other setting or sequence; nor can the setting or sequence be without all the original ingredients in the identical spatial or chronologic order. Hence the obsessive repetitiousness. Hence the reproduction of sentences without altering the pronouns to suit the occasion. Hence, perhaps, also the development of a truly phenomenal memory that enables the child to recall and reproduce complex 'nonsense' patterns, no matter how unorganized they are, in exactly the same form as originally constructed."

Most of Kanner's original diagnoses came from children who were first thought to be feeble-minded or deaf. Further examination, in which he discovered "islands" of ability, convinced him that the intelligence and sensory capacity of these children was intact. Although there is still disagreement as to how early the first signs of autism can be detected, severe disturbances of 2-3 year old children are readily identified. Disturbing symptoms may, however, appear early, and case histories of very young infants classified as autistic are available in the literature (Lazure, 1959; Lewis and Van Ferney, 1960).

Historically, the major characterizations of the autistic child have come about as distinctions were made from specific organic disturbances such as Heller's disease, brain damage, or various forms of mental retardation. Many children now treated as schizophrenics might have, at one time, been diagnosed as brain damaged or mentally retarded (Kanner, 1943). The differential diagnosis between mental retardation and autism is still considered difficult and some children are said to have schizophrenia as a secondary accompaniment of the mental retardation. Many workers emphasize organic or inherited causes of infantile autism (Rimland, 1962; Kay and Roth, 1961). Other authorities regard autism as a pattern of reaction to emotional stresses, therefore a psychogenically based disorder (Despart, 1947; Bettleheim, 1967). Nevertheless, the main emphasis in therapy appears to be manipulation of environmental factors in milieu therapy and individual therapy. Some approaches to treatment include occasional use of electric shock and the therapeutic use of drugs such as insulin, benadryl and lysergic acid diethylamide (Faretra and Bender, 1964).

The behavioral disturbances are of such an extreme sort, arousing severe anxieties and emotional strain which so interferes with functions of the family that the children are institutionalized or referred to long-term medical assistance. The children are often mute, and when speech is present, it is so severely distorted that it has little direct relation to the external environment. The normal developmental changes seen in children of the same age cease to occur and the range of the child's behavioral repertoire becomes narrower. Repertoires already developed, including speech and other social behaviors, often disappear. Violent tantrums, destructive behaviors, loss of bowel and bladder control occur frequently, and much of the conduct seen in children of comparable age is often absent or present in very reduced frequency. There is often a reversal of development, and performances disappear from the repertoire which had already emerged. Kanner (1949, 1954) discovered that many of the parents of autistic children were welleducated and professionally employed. Nine of twenty families, for example, were represented in "Who's Who" or "American Men of Science." He described the parents as "refrigerator parents" occupied with abstractions of scientific, literary, or artisitic sort with limited genuine interest in people. Writers such as Goldfarb (1964(, have emphasized parental inadequacy as significant in etiology and have stressed perplexity and uncertainty in the parent role as leading to the absence of predictable expectancies. Such unpredictability affords relationships less rewarding and more difficult for the child.

Regardless of the specific details of performance, background, environmental and constitutional history, the autistic child's disturbances are of large order of magnitude, representing a very severe departure from the kind of behavioral repertoire that is observed in children of comparable age and stage of maturational development. In the extreme form, there is little difficulty in diagnosis. The very large deviations from repertoires of the normal child is the most obvious aspect of the autistic child. Other factors in the diagnosis of autism are (1) the absence of any signs of somatic or neurological pathology; (2) arrested development; (3) a reversal of normal development and loss of performances which had already emerged; and, (4) areas in which the child functions above the general level of most of his conduct.

The two principal diagnostic criteria which Kanner and Eisenberg (1955) use to arrive at a diagnosis of infantile autism are extreme self isolation and the obsessive insistence of sameness. They derive the other clinical characteristics of the autistic child from these two features, The items are (1) detachment from people, (2) peculiarities of linguistic and motor performance, (3) type of relationship to objects, (4) the conceptual fragmentation, (5) the obsessive trends as shown through the repetitiousness and ritualism. Kanner's description of the autistic child is, in general, confirmed by most other writers in the field, although there appear to be major differences concerning the eitology which lead to variously differing accounts.

A Working Party convened in 1961 by Dr. Creak (O'Gorman, 1967), put forward certain criteria of diagnosis of what they called the "Schizophrenic Syndrome in Childhood" in an effort to delineate the syndrome. The group felt the name "childhood psychosis" was rejected as being too wide. The following points are revisions of the essential features they described:

1. Withdrawal from, or failure to become involved with reality; in particular, failure to form normal relationships with people.

2. Serious intellectual retardation with inlets of normal, near normal or exceptional intellectual function or skills.

3. Failure to acquire speech, or to maintain or improve on speech already learned, or to use what speech has been acquired for communication.

4. Abnormal response to one or more types of sensory stimulus (usually sound).

5. Gross and sustained exhibition of mannerisms or peculiarities of movement, including immobility and hyperkinesis and excluding tics.

6. Pathological resistance to change. This may be shown by:

   a. insisting on observance of rituals in the patient's own behavior or those around him.

   b. pathological attachment to the same surroundings, equipment, toys, people (even though the relationship with the person involved may be purely mechanical and emotionally empty).

   c. excessive pre-occupation with particular objects or certain characteristics of them without regard to their accepted functions.

CHAPTER 1

An instrument for evaluating autistic children by Ruttenberg, Dratman, Fraknoi, and Wenar, (1966) is designed to evaluate autistic children and to measure changes in their behavior. Their attempt is to combine the complexity, richness, and sensitivity of a clinical evaluation with the objectivity of a behavioral rating scale. The core scales focus on areas of relationship, mastery, communication and psychosexual development.

Mahler (1952) describes the development of infantile autism and childhood schizophrenia with Freudian dynamic theory and perhaps a presumption that the child is biologically inadequate. She postulates that if the child makes the proper demands on the parent, the parent is biologically coerced to react satisfactorily to the child because of inherited behavioral patterns.

> "The infant's contact-seeking gestures appeal to woman's most basic biological longing. Hence emotional gratification as well as food are readily given unless maternal pathology has rendered the adult partner unable to respond."

It is not clear here whether the child's developmental failure comes about because it does not stimulate the parent or whether the parent is incapable of the proper reaction, or a combination of both.

Mahler (1952) describes the occurrence of schizophrenia as dependent upon the critical stage when the child's behavior comes under the control of the parent and vice versa. "The toddler gradually delimits his own individual entity from the primal mother-infant symbiotic unit." Mahler, as with the other writers in this field, states that the main cause of the autistic or symbiotic child is a specific conflict of the mother-child relationship.

Bender (1956) defines autism as follows:

> "Childhood schizophrenia involves a maturational lag at the embryonic level characterized by a primitive plasticity in all areas from which subsequent behavior develops. It is generally

> determined and activated by psychological crises such as birth. Anxiety is both the organismic and psychological response calling forth defense mechanisms. The autistic child is repressed, inhibited, withdrawn, often mute, incapable of adequate object relationships. Physically he has labile and inadequate homeostasis, inadequate muscle tone which does not respond to stimulation, although he may be hypersensitive and his postural and motor behavior retains immature features even at the embyonic level."

Even though this language is very general, it is compatible with the behavioral observations drawn by Kanner and other writers.

Many writers make a careful distinction between the autistic and the schizophrenic child. The distinction was introduced by Mahler (1952), as the difference between the symbiotic and autistic child. Mahler distinguishes between the extremely deficient repertoire of the autistic child as contrasted with the more developed behavioral repertoire of the symbiotic child. The distinction is based on the state of development in which progress is arrested. Presumable in the case of the symbiotic child, the developmental process has proceeded normally enough so that fairly complex verbal behavior has developed as well as considerable social interaction with the parent and other adults; while in the autistic child, the development of new repertoires ceased before the child acquired very much of a behavioral repertoire.

The same distinction is reitterated by Bender (1953).

> "Thus, some schizophrenic children are regressed, retarded, fixated, blocked, inhibited, mute, autistic withdrawn, physically esthenic, puny or underdeveloped, unsocial, unable to relate, concretistic in their thinking. But there are other schizophrenic children who are just the opposite. Ther are precocious, develop too fast, have an exaggerated intellectual brilliance, are overactive, and cannot be suppressed in their activity. They have precocious language development, are highly articulate, and often show special gifts

especially in language, the graphic arts, and dancing, and insight into psychological problems."

Rimland (1964) also stresses the importance of treating infantile autism and childhood schizophrenia as separate and quite unrelated entities. He emphasizes that one of the basic requirements for a diagnosis of a childhood schizophrenia is that the disordered behavior must follow an initial period of normal development. In contrast, early autism is defined as being present from the beginning of life. Recent work by Sankar, Cates and Broer is presented by Rimland (1964) which cites a biochemical procedure which discriminates between small groups of children described as autistic and as schizophrenic.

Szurek (1956) provedes a more detailed description by which one may begin to see more of the actual performances that might be expected in an autistic child in contrast to the clinical summaries other writers use. In Szurek's account, one sees something of the way an autistic child spends its day.

"1. Deadpan indifference, for example, in reaction to a parent's departure from the ward.

2. Turning away from an adult 'with anxiously impotent fury' after being hurt in an accidental fall.

3. Speech, if any, is fragmented, parrot like, echolalic, full of reversals and devoid of the personal pronoun I.

4. Quick alternation between laughing, crying, and severe long rages with great destructiveness toward objects and other persons.

5. Self injury;
Frequent genital manipulation;

6. Unusual gaits, self rocking and persistent and monotonous activities. Blank facial expression or other motor signs

> of responsiveness to the verbal approaches of others, giving the impression of deafness. Persistent and lonely interest in a piece of string, a self-made twiddler, fetish object-purse, etc.
>
> 7. Spending long periods lying in bed looking at his own slowly moving fingers held close in front of his eyes. Quiet, listless, and difficult to interest in play.
>
> 8. Little or no effort to dress, feed or bathe or keep clean. Sloppy and careless at the table, using hands rather than utensils. Eating all sorts of objects such as clay, paint, dirt or garbage.
>
> 9. Excellent coordination. A marked difference in the ability to learn various performances not related to the difficulty of the performance."

In summary, the most common diagnostic categories reported in the literature consist of (1) the absence of any specific organic deficit and the elimination of diagnosis such as feeble-mindedness. (2) Essentially normal development followed by an arrest or reversal between the ages of two and four. (3) A severe disruption of the normal repertoire by which the child deals with the physical and social world especially in speech and behaviors related to adults and other children. (4) General loss of control by the social environment. Many major ways in which the child's behavior conforms to and is controlled by the parental and general social milieu disappear. (5) A suggestion of intellectual intactness, inferred from modes of conduct which are inconsistent with the child's overall deficiencies.

A BEHAVIORAL DESCRIPTION OF THE AUTISTIC CHILD T

The growing technical ability to control behavior by principles of operant reinforcement has led to a special interest in infantile autism by experimental psychologists. Part of this interest comes from the usefulness of educational and training procedures suggested by the autistic child's very limited development. Partly the interest of the experimental psychologist comes from the less complex history of the autistic child which offers a simpler context for exposing basic factors leading to the pathology than with adults.

This book will be concerned with an analysis and description of clinical methods. Many experiments with autistic children (Baer, 1962; Bijou, 1965; Harris et al., 1964; Hitgen et al., 1965; Hewitt, 1965; Lovaas et al., 1965; Sherman, 1965; Wolf et al., 1964) have made very important contributions to understanding basic processes and theory. Some have been therapeutically oriented and others have been intended as demonstrations of how reinforcement procedures can be applied to children. The experiments and procedures of behavior therapy will be of concern here whenever they are valid therapeutic procedures for the treatment of a child in the context of the full natural environment. The purpose and function of principles of reinforcement will be of theoretical rather than practical value. Most of the chapters which follow, will elaborate this theme. Some of the ways in which the preceding clinical descriptions have been paraphrased in simple descriptive language have begun the task.

If one were to spend a day watching an autistic child, the most obvious characteristic of the child's behavior would be his general activity. He would spend long periods of time lying on the floor or sitting quietly in a chair. Many of the child's performances would be self'stimulatory, such as rubbing a rough spot on the floor. babbling repeatedly to himself, chewing a piece of string or a pebble, licking a part of his body like a cat who is grooming, repeatedly sliding one hand against the next, or flipping sand so as to produce a visual pattern. There is usually a high frequency of screaming, crying, tantrums, and self-destructive behaviors in which the child bites or hits himself. Sometimes these self-destructive acts are so persistent and frequent that the children are kept in restraints such as a straight-jacket or stretched across a bed by tying their feet to the bed posts and their hands to the headboard. Children have been observed to have struck themselves around the head and aace to the point where their face was a mass of bruises or pressing their eyes to the point of blindness. Much of the child's behavior is of a simple and primitive kind in which he creates an annoying situation which controls the adult's behavior. He stands in front of the door and screams until someone opens it for him. He prevents the removal of a toy by screaming so long as anyone attempts to take it. He resists any interruption of his simple repetitive acts or disruption of the usual routine. In general, most of the child's behavior can be described as having very minimal effects on the environment. Where they are large effects on the environment these mostly tended to be atavisms--very primitive conduct such as biting, kicking, screaming, and tantrums which created an intolerable situation for people. Many writers comment on the verbal behavior of the autistic child as babbling and striking (Rimland, 1964). Only about half speak at all, and these non-communicatively. The others are mute or speak once or twice in a life-time. Frequently verbal behavior is likely to be non-vocal and of a sort which creates an aversive situation for the listener who terminates it by avoiding it or doing something else, as the child screaming in front of the door. Much vocal behavior (humming and noises) when it occurs is usually not verbal in the sense that it has any relation to the verbal repertoire of any potential listener.

Frequently as one watches an autistic child for a period of time, one would see many behavior patterns that are obviously primitive and disturbed. Yet these behavior patterns are not sufficient evidence to say that the child is autistic. Almost any child may be seen to sit quietly, gaze blankly out of the window for long periods of time, to grimming in a bizarre way or engaging in a severe tantrum. Many otherwise normal children carry out highly repetitive activities such as running a stick over a picket fence, compulsively stepping on each line in the sidewalk on the way home, or sucking a piece of cloth or a rubber balloon for a long time. It is the frequency of these behaviors that distinguishes the autistic child. Even though all of the primitive behaviors may be seen in otherwise normal children, they form a prominent part of the autistic child's repertoire. Primitivisms or atavisms as they are sometimes called, are a large part of the autistic child's total behavioral resources. In contrast to the normal child who has many alternative ways in interacting with the physical and social environment. Large parts of the autistic child's day may be spent in gross inactivity as, for example, when he is staring out of the window, sleeping or lying huddled on the ground in a corner. When the child is not totally inactive, the performances are likely to be of a simple repetitive sort such as pacing back and forth in almost endless repetitive pattern. These performances are not likely to have much relation to the behavior of other people, nor are they likely to disturb the physical environment very much. A limited period of observation of a child may be very misleading particularly for some who focus on pathology. A child observed casually in a furniture store was lying on the carpeted floor for perhaps 5 or 10 minutes staring vacantly at his fingers and appearing to be withdrawn. Until the child got up and carried on a normal conversation with his mother about a candy bar, he resembled any number of children who could be seen as hospitalized patients.

One may summarize the repertoire of these children as an enormous performance deficit. These are children in whom we fina a lack of many or almost all of the ways in which the normal child interacts with changes and is influenced by his social and physical environment. Other important characteristics are the simplicity of the reinforcing stimuli maintaining the child's performance and the lack of control by the social environment.

Non-Social Reinforcers

Small changes in the physical environment as, for example, direct stimulation of the mouth, splashing water, smearing a sticky substance on the floor, breaking a toy, or repeated tactile sensations, appear to sustain the largest part of the autistic child's repertoire, Yet, we cannot presume that these are strong durable reinforcers because they maintain performances with such a high frequency. It is likely that these events appear to be durable reinforcers because the alternative performances are also weakly maintained.

The durability and effectiveness of a reinforcer can usually be determined best by reinforcing the behavior intermittently or by providing a strong alternative which could interfere with the behavior in question. In the controlled experiments with autistic children (Ferster, 1961 a, b), most of the consequences sustaining the children's performance in the experimental room, such as color wheels, moving pictures, music, and so forth, were very week reinforcers compared with food or candy, at least initially. In contrast, normal children could sustain very large amounts of behavior through the non-food reinforcements.

Little behavior of the autistic child is maintained by conditioned or delayed reinforcement or sensitive to the details of the environment. The controlled experiments with autistic children gave some measure of the magnitude of the deficit. A normal child in the experimental room described above quickly began using coins to operate food dispensers, paid attention to the lights which signalled when a device was operative, worked for a towel or a cap which used for a later (deferred) activity such as swimming or going for a ride in a car and was able to persist in an activity when it was necessary to earn 5 coins before they could be used. With autistic children all these kinds of conduct needed to be developed in slow stages with a slow, carefully arranged training program.

Failure to Develop Conditioned and Generalized Reinforcers

The repertoire of the normal child consists almost entirely of sequences of behavior that are maintained, in a chain or sequence, by conditioned and generalized reinforcers. An example of a chain of responses would be the behavior of the child moving a chair across the room and using it to climb onto a table top to reach a key which in turn opens a cupboard containing candy. This complicated sequence of behavior is linked together by critical stimuli which have the dual function of sustaining the behavior they follow (conditioned reinforcement) and setting the occasion for the subsequent act. The chair in the above example is an occasion on which climbing onto it will bring the child into a position where reaching for food on the table top will be reinforced by obtaining food. Once this behavior is established, the chair in position in front of the table may now be a reinforcer. As a reinforcer it can increase the frequency of any performance which moves the chair into position. The position of the chair is the reinforcer because it makes possible the next act in the sequence leading to the food. A certain amount of behavior is necessary before such a productive sequence of performances can develop. Unless the child is disposed to take a cooky, there is no reinforcer for turning the key. Until the child uses a key there will be no bases for climbing behaviors and until the child is disposed to climb there is no role for the chair.

Even more behavior is required for the development of generalized reinforcers. A change in the physical environment may become a reinforcer of itself when the child has moved enough objects about the house and changed his environment in many ways relative to many deprivations and reinforcers. When the overall frequency of performances in the child's repertoire becomes abnormally low, it is likely that generalized reinforcers, and hence more complex behavior, can develop.

Generalized reinforcement has many of the cannotations of secondary process. It may alter behavior regardless of the individual's momentary state of deprivation. It is the uniquely human reinforcer that makes possible much of verbal behavior, education in general, and self-control. Parental "attention," the occasion when the child can influence the parent, is probable one of the most important generalized reinforcers normally maintaining the child's behavior. Inattention is an occasion when a performance is likely to be ineffective. Hence, the parent's performances such as smiling, saying, "Right," "That's fine," or "What is it" all come to serve as conditioned reinforcers. Their emergence as generalized reinforcers, as with simpler chains depends upon whether the child has any performances whose reinforcement is more likely when the parent is paying attention and smiling than when he is frowning or inattentative.

CHAPTER 1

The Autistic Child's Perceptual Repertoire

A low frequency of performances which act on the physical and social environment will interfere with the child's perceptual repertoire as well as with the development of reinforcers. This follows from the basis process which brings the child's conduct into contact with the critical part of the environment. Many kinds of conduct are effective in some circumstances and ineffective in others. For example, speaking is generally effective only in the presence of a listener. A performance's success on one occasion coupled with its failure on another increases its frequency on the one occasion and decreases it on the other. Until a child uses a chair as in the previous examples, there is no basis for him to notice a chair in any special way. The reinforcing effect of the chair in the above example depends upon its being the occasion on which further performances may be reinforced. Without a large repertoire whose outcome is different in different circumstances there is little basis for the child noticing the details of his world. Until stimuli control some of the child's performances, conditioned reinforcers cannot develop. Thus there is a necessary developmental sequence in which each process depends on the components of a prior one. A general lack of behavior prevents the development of conditioned reinforcers. A limited development of simple conditioned reinforcers in turn prevents the development of a generalized reinforcer. Without conditioned and generalized reinforcers there is little change of augmenting the child's repertoire or developing speech. Parental responses such as smiling, "Good," or "Right,"can have little effect on the child if there is not a history by which many different forms of the child's performance have produced various reinforcers on these occasions. Without parental generalized reinforcement, normally carried out by the use of praise and parental attention coupled with mild forms of threats of discontinuing the reinforcers, educational processes and positive parental control are all but impossible. e

Even after there is a generalized reinforcer, its needs to consistently related to the child's conduct in order for it to continue to function. Thus the parental form ceases to be a generalized reinforcer when it no longer serves as a link between the child's conduct and the reactive environment that maintains it. The actual form of the parents' generalized reinforcer is not nearly as important as the conduct it makes possible for the child. Smiling and attention are generalized because the parent tends to react in particular ways when smiling and paying attention. If the child has no behavior in his repertoire that will be more likely to be reinforced on the occasion of a parental smile, however, it matters little what the parent's reinforcing practices are when smiling as against when frowning. Conversely a smiling parent or one who appears to be paying attention will not necessarily reinforce very many of the child's performances.

It is very difficult to determine the stimulus and perceptual repertoire of autistic children. When a child reacts to a complex situation, it is not usually clear what aspect of the situation is controlling his behavior. For example, it is usually difficult to determine how meaningful speech is to a child since the total situation is usually so complex that many stimuli could provide the basis for the simple performances. Similarly with visual repertoires.

CHAPTER 1

etiology of autism

Faced with a deficit as great as that of the autist the question naturally arises as to whether it is due to an inborn biological deficit, or special circumstances in the child's experience not adequate for developing the performances necessary for dealing with the social environment.

As with almost every behavioral pathology, there is considerable discussion in the literature as to the relative merits of dealing with the constitutional and genetic aspects of the behavioral disturbance verses the environmental or functional aspects, (Kallmann, 1956; Kanner, 1954, a, b; Bender, 1952). Large behavioral deficits clearly can come from a deficit in the child's somatic or nervous structure or from destructive or deficient early experiences. No one really doubts that severe illness or many somatic difficulties may retard the child's development. Yet the evidence for a biological deficit as the primary causitive factor in autism is meager, and the role in autism inferential, at least at present. Some of the evidence comes from parents who report that the child seemed different at birth. They frequently say that the child stiffened every time it was picked up. Minor anomalies such as abnormal EEG patterns have been reported as well as other soft neurological signs but the evidence is minimal and not very different from the range and frequency of symptoms which might be found in other such children. The arguments revolve around the weights to be given the organic or experimental factors and the courses of action to be taken.

Yet we do know that the environment and the child's history of interaction with it is capable of weakening and preventing the development of behavior. There is evidence of the effect of extreme socially deficient environments such as the Wild Boy of Averon who grew up in the forest, or children locked in a closet for most of their early lives. The result is a primitive animal-like child. The extreme cases of deficient environmental experiences show that the child's repertoire comes from its interaction with the environment. Conversely laboratory experiments have shown that it is possible to build new behavior in autistic children by arranging a current environment.

Such increments in an autistic child's repertoire were first demonstrated in experiments in which the children pressed keys reinforced by parts of their lunch from a vending machine, pennies which could be used to operate a train, or inserted into a device out of which a towel would drop which could be used after the experimental session to go swimming (Ferster, 1961, 1962). Later experiments (Wolf et al., 1964; Lovaas et al., 1965 b; Zimmerman and Zimmerman, 1962; Girardeau and Spradlin, 1964; Risely and Wolf, 1967; Patterson, 1965; Shah, 1966; Bandura, 1967; Lovaas, 1967), have extended similar procedures into the ward environment and over larger parts of the child's daily routine. Although not all of these experiments were intended primarily as therapy procedures, they all showed that the limits of the child's repertoire had not yet been reached. In every case the autistic child's repertoire was extended, sometimes with dramatic therapeutic advantage. Successful therapists, such as Jeanne Simons have also made the same demonstrations clinically. Autistic children, for example, have progressed from mutism to attendance at Public School (Chapter 9).

The experiments proved that it was possible to build behavioral repertoires in these children under the control of arbitrary environments much as we do with animals or people in the experimental laboratory, that the processes were perfectly normal, and that the ability to sustain behavior under these conditions was limited only by the skill and knowledge of the experimenter.

In the face of our ever expanding ability to arrange environments which being the autistic child to increasingly higher levels of behavioral development, it seems wise to operate on the working hypothesis that the early lives of these children there was a special set of circumstances which led to a failure to develop a normal repertoire.

For the purposes of this book, emphasizing the psycholocical treatment of the child, we will not emphasize the role of orgsnic disfunction. First, the children who will be described were selected for admission to the treatment center because there was no obvious organic disfunction. Second, even if it turned out that organic factors were causative we would still be faced with the problem of educating the child cognitively emotionally and socially. Many workers have already demonstrated effective therapies for rehabilitating even brain-damaged children (Cruickshank, 1961; Strauss and Lehtinen, 1950). Whatever organic causes we ultimately discover for childhood schizophrenia we must turn to the child's experiences in the social and physical environment to reinstate or establish his ability to live in the human world.

The Environment as a Cause of Behavior

l|i It is probably as usefull for the psychologist to consider the child's interactions with the environment as a cause of behavior as it is for the neuro-physiologist to look for the neural events that percede a performance. Where there is a somatic or neurological handicap, psychotherapy undoubtedly needs to be adjusted to the particular form of the child's handicap. For the psychologist and therapist, however, the primary task will still be the creation of life experiences that will augment the child's repertoire.

The importance of the child's interaction with the environment as a cause of behavior makes it necessary to understand the environmental and experiental causes of behavior first, before searching for physiological causes. A functional understanding fo the environmental control of the child's conduct defines the problems for which the physiologist may seek the antecedent organic events. Were it not for a gross deficit in the child's conduct we would not be likely to seek a disfunction in any underlying physiological system.

Whether or not the environmental or physiological factors turn out to be the major ones in producing infantile autism, an analysis of the environmental control of the autistic child's behavior will simplify the problem of discovering the relevance of the various subsystems which find their final expression in the child's repertoire. The problem is quite analogous to that of determining the behavioral effect of a drug, such as a tranquilizer. It is necessary to know first what kinds of conduct constitute tranquilization before the changes produced by the drug can be noted. In practice organic disfunction is frequently discovered as a result of attempting to build a normal repertoire with psychotherapy. The emerging repertoire provides the signs for a neurological diagnosis that would not have been possible otherwise.

It is to be hoped that a systematic, natural science description of the behavior of the child in relation to the environment will pose problems and specify performances which will enable us better to understand how the organ systems of the body contribute to man's behavior. Even though the main purpose of this book and the kind of thought that it represents is to discover how the child's environment is responsible for the gross deficiencies in its repertoire, such knowledge should eventually be critical for the discovery of physiological mechanisms of behavior.

Specific ways in which the child's experiences, particularly parental practices, cause childhood schizophrenia will be discussed in Chapter 10. Included also will be a discussion of some of the ways organic disturbances may interact with the environmental developmental process.

Although there is no compelling evidence that there is an organic disfunction at the root of autism or childhood schizophrenia, we will probably never be sure some contributing factor will not, one day, be discovered. Should some organic disfunction be discovered we will still face the problem of how to build a normal repertoire after the disfunction has been remedied or despite its presence. Many individuals lead adequate lives despite anatomical and physiological handicaps. Therefore, the question of whether there is an inborn deficit in these children is perhaps an improper one, for our purposes here. Whether or not there is an inborn deficit, the children are susceptible than other children matters less for the purposes of this account than our discoveries of ways to develop new abilities.

CHAPTER 1

SIGNIFICANCE OF AUTISM IN CHILDHOOD SCHIZOPHRENIA

Although increasing numbers of autistic and schizophrenia children are being discovered as centers become more sensitive to their diagnosis, it is still a relatively rare disturbance. Compared with other kinds of retardation, brain damage and physical and sensory handicaps which children suffer, infantile autism is not a major mental health problem. Yet the scientific and clinical study of autism has attracted great amounts of attention and research far beyond what one would expect from the relatively low incidence. One reason that autism has attracted so much research attention is that it is such a profound behavioral disturbance occurring in such very young children, without the long and elaborate history of the adult. For those interested in environmental factors the relatively brief history of the autistic child create none of the enormous complexities of the adult experience. For those interested in organic factors, the brief environmental history of the autistic child is taken to mean that organic factors play a large role for such a profound psychosis to occur with so little experience.

The brief history of the autistic child's difficulties also overcomes some of the problems of dealing with retrospective accounts of behavior. Even with the two-to five-year-old child, it is very difficult to obtain accurate reminiscences from parents of the actual performances of the child or the actual child rearing practices of the parents. There is the possibility, however, of actually observing the child in the parental environment. Such observations will become increasingly frequent as infantile autism comes to be recognized earlier in the child's development. Observations of the child's development. Observations of the child are easier than with the adult because of the child's lack of mobility, and the normal restrictions on a child's activities as compared with an adult.

Autism suggests a model psychosis whose successful treatment will teach us much about other children's problems and adult psychosis. While the exact relationship between the two behavioral conditions is not exact, the gross features of the two repertoires are similar. In both the adult and childhood schizophrenia, behavioral repertoires or performances are missing which the normal individual has intact: The adult no longer dresses or eats with utensils. He stops carrying on his daily yy employment, he becomes incontinent, and speech is lost, impaired or limited. In both the child and the adult repertoires, there is a general disappearance of many behaviors which normally occur with high frequency. Adult disturbances frequently seem more obvious than children's because we are not likely to notice limited behavioral repertoires in children as much as in adults because the child's age must be taken into account to evaluate its development. Psychosis in adults is usually detected from a reduced frequency of performances which the adult carried out in the past. He may become secretive, rarely talking to people, stay in bed all day long, stop going to work, no longer read newspapers, et. Correspondingly, of course, there may be an increased frequency of other performances which preempt many normal activities. There are also, of course, many important differences between the psychotic child and adult.

The common feature between them, however, is a low or zero frequency of dealing with the physical and social environment. The common features between the child and the adult condition does not, however, imply a common causal condition even though psychotic children grow up to become psychotic adults, Many different conditions, some of which will be analyzed in Chapter 10, can weaken the repertoire of a child or an adult. The common element between various kinds of psychosis may well turn out to be our ability to analyze and describe the various kinds of environmental antecedents that may weaken or distort an individuals conduct. When we understand the ways in which behavioral deficiencies occur in young children and the techniques for ameliorating them we will have developed tools which can accomplish the same task for understanding and treating adults.

The introduction has given the reader, unfamiliar with childhood schizophrenia an over-view of the problem to which this book is focused. Chapter 2 will describe the Linwood Project, its goals, how it was carried out and the roles of the participants. The theoretical and technical problem of the classification of behavior pathology, and detailed description of the autistic child will be taken up in Chapter 8. The remaining chapters of this book will elaborate the specific results of the various parts of the project and present these along with some of the theoretical advances that have occurred along with research on childhood schizophrenia.

Chapter 1

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CHAPTER 2

THE LINWOOD PROJECT

The Linwood Project was an experiment in which the techniques of experimental psychology and operant reinforcement principles were used in a treatment center to gain in the understanding and treatment of autistic and schizophrenic children. The project was a collaborative effort of an experimental psychologist, this author, and Jeanne Simons, the Director of the Linwood Children's Center.

The impetus for the Linwood Project came from the conviction that general principles derived from the laboratory science of behavior can provide a rational, natural science basis for therapy. This conviction arose from the great success in controlling animal behavior in the laboratory and with the discovery of general principles of behavior relevant to the individual organism. If it were possible to alter the behavior of the individual subject in the laboratory, the same approach should work in the clinic by arranging the environment of the individual patient. The extensions of laboratory procedures to people have confirmed the power of a laboratory science of behavior. Many of the experiments, usually literal analogues of animal laboratory procedures carried out under the rubric of behavior therapy, had disturbed children, frequently schizophrenic and autistic as subjects. Many used food or tokens as reinforcers, and the performance was often an arbitrary one chosen to make it easier to measure frequency.

Many of these behavior therapy experiments were carried out to document and prove the effectiveness of a behavioral procedure compared with a clinical one. There still remained the problem, however, of the day to day use of behavior principles in the various kinds of treatment centers in which the commitment is to the welfare of the patient rather than the documentation and proof of a procedure and method. In such a therapeutic environment, all methods and procedures which could possibly benefit a patient are used whether or not the proof of their effectiveness is communicable. In these treatment facilities, where there are so many effective therapists and methods of therapy, the problem is not so much the invention of better methods but the use of a conceptual scheme and an objective behavioral language which distinguishes effective from ineffective procedures. A widespread therapeutic result will be possible when effective techniques of therapy can be broadly disseminated.

Rather than using operant conditioning as a clinical method, the goal of the Linwood Project was a broad entry into the treatment center beginning with and building on existing clinical methods and skills. The role of the project is that of an advisor who helped the Linwood staff achieve its goals within the framework of their own skills and expert knowledge. The starting point of the project was, therefore, the actual practices and problems that were currently used at Linwood. The project emphasized a training program to teach the staff to observe the children, their own interactions with them, and demonstrations by experts. We expected that the sensitivity of the staff members to the fine details of the children's behavior would lead to a refinement of their therapeutic technique, the development of new techniques and the ability to communicate them to others.

THE GENERAL PLAN OF THE LINWOOD PROJECT

The project was carried out in approximately three stages. In the first stage C. B. Ferster and the project staff studied Linwood in action, learned about Jeanne Simons's method of therapy and clinical concepts, described the conduct of the children and therapists and mirrored these to the staff in simple but objective and behavioral language. In the second phase of the project, the key Linwood staff learned behavior principles and began using them to refine the descriptions of therapy procedures. With this new skill in identifying general processes, they began to experiment with ways to pass on therapeutic skills to counselors and assistant therapists. In the third phase of the project, ways were sought to teach the staff to apply simple reinforcement principles in the classroom and elsewhere. During this third phase, the staff was encouraged to alter the children's behavior by arranging the physical and social environment self-consciously and rational.

The training in the experimental analysis of behavior provided a common language among the principles of the project, which substituted detailed factual accounts of the child's conduct for clinical shorthand descriptions. The ability of the staff to describe behavior factually eliminated the need for jargon, whether psychoanalytic or operant conditioning. Instead, a method of communication evolved which referred to the actual behavioral events from which such jargon terms might be constructed. As a result, we found, for example, a psychoanalyst such as John Cameron, a therapist such as Jeanne Simons, an experimental psychologist such as C. B. Ferster and a psychiatrist such as Kathryn Schultz being able to describe and analyze children's conduct or discuss problems of treatment procedures without misunderstanding or argument about theory.

There was considerably more problem with the design and implementation of a training program for counselors and assistant therapists than there was for the professional staff. It became clear very early in the project that there was little difficulty in imparting the maximum value of a technical behavioral language to clinicians such as John Cameron and Jeanne Simons who already had considerable skill in dealing with human behavior. Such clinicians quickly incorporated the new concepts and descriptive skills as a new tool into their existing practice. Since many of the Linwood junior staff had neither clinical experience nor knowledge of experimental psychology, the training problem was doubly difficult. With these people a technical knowledge of behavior and genral behavioral processes helped them profit from direct experience with children and observations of experts like Jeanne Simons. We discovered that a behavioral language allowed the Linwood staff to observe small moment-to-moment details of the child's and Jeanne Simons's conduct which they would otherwise not see. The behavioral language increased the ability to observe because it referred to specific performances and the relevant immediate change they produced in the social or physical environment. The use of a technical language in such a fine-grain relation to the child's conduct, almost forced the trainee to learn to observe small details of behavior. A knowledge of reinforcement principles also provided concepts which helped students to select those details for observation and retention that were valid and relevant. When a counselor or therapist was aware of and remembered the smallest detail of the child's conduct, it becomes possible to react uniquely and personally to each child, meeting his existing current repertoire rather than imposing the adult's needs and expectations. The emphasis on current fine-grain behavior also reduced the therapist's or counselor's tendency to categorize and label the child. Clinical training, involving long-time spans of the child's behavior and an ability to anticipate future events from current behavior, clearly required that the student be able to observe and remember the many details of the child's conduct.

Despite the project's emphasis on principles of operant reinforcement, it was never presented as a method of working with children but as a way for the Linwood staff to achieve expertise in their own content area. The aim was to produce more expert therapists, not operant conditioners. An ability to describe complex behavior simply and objectively was considered to be one of several basic tools, such as a knowledge of normal child development. The actual methods to be used with children were clinical ones.

The many different activities contributing to the main direction of the project included (1) the description in objective behavioral language of Jeanne Simons's treatment procedures, (2) the design and implementation of a training program for teaching Jeanne Simons and the Linwood staff the technical skills of a functional analysis of behavior, (3) composing and assembling teaching materials for both the clinical and experimental concepts, (4) teaching materials and teaching techniques designed to allow the clinical student to apply experimental concepts in his work with clinical materials, (5) the design of classroom procedures, including the use of teaching machines and programmed instruction material, to produce an intellectually reactive environment for the children consistent with sound social and emotional development, (6) the design of teaching machines and the construction of programmed instructional materials for individual children at all stages of development, (7) assembly of direct descriptions of children's behavior to be used for teaching materials and as examples of Jeanne Simons's methods of therapy, (8) a functional, fine-grain reinforcement analysis of a child's development over a two-year period as a model of description of therapy and behavior, (9) the relation of operant reinforcement principles of psychoanalytic and other clinical concepts as exemplified by direct descriptions of the children's behavior, (10) training programs for the parents of the Linwood children. These topics will be discussed in the chpaters which follow.

THE DEVELOPMENT OF THE PROJECT

The introduction of new procedures, concepts and languages to Linwood was of itself a problem in behavior change of at least the complexity of changing the behavior of the children. As the project evolved, the concept of how to influence the Linwood environment took the same form as the problem of changing the behavior of the children. The starting point had to be the on-going performances in the institution and their current reinforcers. To arbitrarily impose the project's goals and techniques would risk a temporary result evaporating as soon as there were no longer any pressures from the project. Therefore, the model was that of classical operant reinforcement (or psychoanalysis) where the agent of change reacts to the individual's existing repertoire. The project personnel served as advisors who could assist the Linwood staff to achieve their goals and fulfill their needs by technical advice, training and sometimes actual help in therapy. The criterion for the introduction of a procedure was, at least ideally, whether it met some existing need in the current level of the Linwood operation. The distinction (to be elaborated in Chapter 3) is that of arbitrary or natural reinforcement, so important in all kinds of psychotherapy. In those cases where project staff imposed changes on Linwood to achieve project goals, the result was inevitably an indirect attack on some project person or a failure to carry out the innovation. It was therefore necessary to observe the total Linwood environment, constantly discuss the problems of concern to the Linwood staff, and wait for an appropriate time for each increment in training or therapeutic innovation. The role is very much like that of the psychoanalyst and patient. The interaction is defined by the perceptions, needs and level of operation of the patient. The analyst can help the patient observe those parts of his life which he needs to see more clearly and he can help him to learn new ways to achieve goals already important in his life and for which he is disposed to work. The performances the therapist might wish the patient to have are as irrelevant for the patient as the procedures and training programs the project staff wished to see tried are for the Linwood staff.

The Relationship between C. B. Ferster and Jeanne Simons at the Start of the Project

Although many persons have contributed vitally to the Linwood Project and although the project could not have been even approximated without their help, the project is imbedded in the personal and intellectual relationship between the two principals, C. B. Ferster and Jeanne Simons. The collaboration between the project and the Linwood staff stemmed from and took its form from this relationship. Hence the story of the project is a personal one coming from the backgrounds of the principals. The first point of contact between the project and Linwood was a meeting between C. B. Ferster and Jeanne Simons in the summer of 1964.

C. B. Ferster had carried out experiments from 1958 to 1960 in an automatically controlled laboratory setting in which the repertoires of autistic children had been expanded and automatically recorded (Ferster, 1961). The experimental room contained a large number of devices which provided a rewarding consequence when a coin was inserted. The devices included a pin-ball machine, a trained pigeon, a trained monkey, a kaleidoscope, a phonograph, a TV set, an electric train, candy and food vending machines, an electric organ, among others. The coins were used to reinforce experimental performances such as pressing a key or matching to sample. These experiments showed that even the most severely autistic children were capable of interacting with a well-defined and reactive environment to develop new performances. The limits to the amount and complexity of the behavior that could be produced and maintained in such an environment were the skill and technical resources of the experimenter rather than the capability of the child. In addition to the reactivity of the child to the increasing complex experimental environment the automatic recording of a simple arbitrary performance showed that the form of the behavioral processes was normal, like the same processes recorded in many other laboratory situations with normal and abnormal subjects, animals and humans.

Despite the unusual success that was achieved in maintaining the children's behavior--it was, for example, possible to sustain continuous involvement for as long as three hours with children who normally did not sustain attention for more than 5 minutes--and the complex repertoires that were achieved, the ultimate applications of reinforcement principles to rehabilitative of the autistic child was thought to be in the area of social behavior and human relationships. The results of the experiment simply showed it possible to create behavior by normal behavioral processes. Actual rehabilitation would need a social-human environment. The problem was expressed in the original report of the research as follows (Ferster, 1961):

> "We do not consider these techniques as attempts at rehabilitation but rather as experimental analyses of the actual and potential repertoires of these children. Perhaps these analyses can serve as guides for attempts to use the same processes of developing behavior in social situations where the performances sustained and altered would be activities in respect to other persons (social) and where the important consequences sustaining the activities would be the social effects of these performances. If it proves possible to develop and widen behavioral repertoires significantly in the experimental room, then this would seem to indicate the possibility that the same potential for behavioral change would exist in the social milieu if the proper conditions could be generated. In the same vein, systematic deficits in particular areas may indicate deficient areas of control which may be of use in determining techniques for handling these children."

Part of the impetus for the experiments with autistic children in arbitrary experimental environments with food and other non-human reinforcers was the widely held assumption at that time that the prognosis for autistic children is very poor (Rimland, 1964; Kanner and Lesser, 1958). The accomplishment of these experiments was evidence that these enormously disturbed children could profit from interaction with a properly reactive environment, that the basic behavioral processes appeared normal, and that the limit of the child's repertoire appeared to be in our ability to build an environment which is sensitively reactive to the child's current repertoire and which could be slowly changed in the direction of the required growth and development paced with the child's progress. The experiments probably were of theoretical and technical value because of the controlled measurements which came from them and because of the general techniques which were developed. It is problematical if they would have been carried out for clinical research purposes if it were known at that time how effective therapeutic procedures were such as those carried out by Jeanne Simons.

The continued application of reinforcement principles to rehabilitate autistic children required a new experimental paradigm, new techniques and skills and a new setting. An accomplished therapist such as Jeanne Simons, whose work with children involved such active arrangements of the child's milieu and such lively interaction with its repertoire, suggested a means for continuing the development of rational, therapeutic procedures. Jeanne Simons already had developed an environment that encouraged social development and human relations. Her already impressive skills in social interaction with children would surely be a basis for starting experiments toward the rational use of and objective description of the social environment. If C. B. Ferster's research was to produce any more progress toward a rational objective therapeutic environment the skills and facility of Linwood and Jeanne Simons would seem to be critical.

Jeanne Simons was confident of her ability to influence the children. Most clinicians who knew her acknowledged her skill and effectiveness. There was a constant frustration, however, to communicate her insights, perceptions and methods to others. There was even difficulty of communication to her own therapists and counselors who operated at a level of skill far below hers and found it hard to understand how she worked with children. Most people looked on her work with awe and found it generally difficult to articulate what she did. Her first contact with C. B. Ferster at a lecture on behavioral description and etiology of autism made it clear that he had an ability to describe the children's behavior and the social circumstances surrounding it. If he had an ability to describe behavior perhaps he could articulate her methods of working with children so that they could be communicated to other children's centers and used to train the Linwood staff.

After the project had been underway for sometime, Jeanne Simons expressed her need for a communicable language and its impact on her as follows:

> "In my teaching experience before the Linwood Project, a student could learn my approach and techniques if he were intelligent and intuitive. This was difficult to do and not too efficient a learning situation.
>
> I can't yet fully explain intuition--although people have often told me I had exceptional intuition. Intuition can only be used to greatest advantage when used with intelligence. When I have been pushed for more explanation of intuition, my only statement has been that intuition is an accumulated amount of observation--what kind of accumulation was not known. Intuition is also paired with timing, and timing seemed inexplicable. I have often said, 'One has to have eyes all around, plus antennas--to pick up the right vibrations.'
>
> Until the project there was a kind of magic about timing and intuition because I couldn't say why or when; I just knew it was the proper time. The whole attitude was disturbing because I felt there was really no magic, but rather that I arrived at certain actions with a child properly timed by intuition.

> There were some specific and concrete but undefined and unseen roads that lead to my actions.
>
> I am sure many intuitive professionals have theoretical and analytical answers for moves they make, but as yet, I haven't seen anything describing whole layers of thought which explain, arrive at, derive at the whole process.
>
> The major gain I have made through the Project is that I can go back to analyze all the observations and minute steps that precede the 'act of timing' or interaction with the child. This makes possible understanding the accumulation of fine steps and observations that I'm not conscious of but store-up which I then call intuition. This is added to one's basic capacity for intuition. If one would merely act on intuition, one would draw on accumulated observations without ever knowing why and on what one had acted; then the aura of magic continues.
>
> Being able, through the project, to observe minute details, I have also been able to observe fine details within myself; one could again call it intuition. The gain is greater than that, however, for I am aware that the accumulated detailed observations gain subconsciously are forming organized steps leading to the interaction with a child based on intuition.
>
> It's as when one works underground and there is a ladder going up to the light. Although it is dark, one knows when he goes up the ladder to the light he is ready to step out.
>
> Because of my own insight, I see how logical my 'magic' was. It is now much easier to teach in a sequential and concrete way."

Thus from the start, the two principals had a common motive whose outcome needed their combined, complimentary repertoires. C. B. Ferster knew how to describe complex behavioral interactions simply, objectively, and in the context of general behavioral processes. Jeanne Simons had constructed a social environment which augmented the children's personalities and she had the therapeutic skills to deal sensitively and in detail with each individual child and to carry out the day to day intervention with long range goals (the whole child, she would say) in mind. A therapeutic attack on the problem of autism which is applicable beyond one or two intuitive therapists and which is valid for the child's total, long-term development required the knowledge of both principals.

Much of the activity during the several years of the collaboration between Jeanne Simons and C. B. Ferster took its form from their basic relationship. The need for each other's knowledge and expertness persisted throughout the collaboration. The following account expresses the form which it finally took (Ferster, 1967):

> "The bridge between my general knowledge about behavior and practical knowledge about children began when I observed Linwood's clinical staff, particularly the Director, Miss Simons, who is an especially gifted therapist. One incident was an interaction between Miss Simons and Karen, a four-year-old autistic girl. Karen had been in day care at Linwood for about two weeks during which she spent most of her time clutching a plastic doll and crying. Let me read my original notes to give you the flavor of Miss Simons's style and the kind of events which I saw and recorded.
>
> Jeanne Simons placed Karen on a rocking horse where she stayed without crying as long as Miss Simons rocked the horse and sang to her. After a few minutes Miss Simons stopped rocking the horse for brief periods but kept on singing. She carefully sensed how long she could stop rocking the horse without losing control of Karen. The return to rocking always followed some behavior other than crying. In general Miss Simons stopped rocking the horse whenever she judged that Karen's behavior was strongly maintained by some current factor such as playing with the handles of the rocking horse. Next, Miss Simons took the plastic doll from Karen's hands, set it on a nearby table, and quickly moved the table next to Karen who promptly picked up the doll. One would guess that under other circumstances taking the doll away from Karen would lead to screaming. Although Karen was without the doll only for a few seconds, this situation provided the basis for the reinforcement of a specific constructive piece of behavior--reaching for the doll. This was the first time that Miss Simons required some behavior of Karen.
>
> Now Karen moved the rocking horse slightly, and Miss Simons's singing usually occurred contingent on the rocking. When Karen sat quietly, Miss Simons simply watched, smiled, and hummed gently. When Karen rocked, Miss Simons sang in rhythm to the movements of the horse. Then the episode with the doll repeated, but this time the movements were a little slower and Karen was without her doll for a few seconds longer. When Karen returned to rocking, Miss Simons sang in rhythm. Soon Karen placed the doll on the table herself. This probably occurred because the behavior controlled by the rocking horse was becoming prepotent over that

controlled by the doll. Also, it was difficult for Karen both to clutch the doll and to hold the handles of the rocking horse. Karen continued rocking without the doll for over a minute as Miss Simons sang along. The magnitude and rhythm of the rocking were quite vigorous.

Next Miss Simons kept silent for brief periods while Karen rocked. Technically this was intermittent reinforcement of the rocking. At this point Karen turned to the doll, possibly because she was less inclined to rock the horse when Miss Simons did not sing. But in picking up the doll Karen dropped it to the floor, perhaps accidentally, and for the first time during the episode, she began to cry. Miss Simons asked, 'Do you want to pick up your doll? I'll help you,' and extended her hands to Karen. When Karen touched Miss Simons's hand, Miss Simons clasped Karen's hands and helped her from the rocking horse. When Karen did not lift her foot over the saddle, Miss Simons simply held her there until she made some movement. When Karen did not move, Miss Simons prompted the behavior by moving the foot partially over the saddle and allowed Karen to complete the final part of the action. Miss Simons then held Karen in the vicinity of the doll until Karen picked it up, and once more she offered her hands as she said, 'Do you want to get up?' Karen lifted her hands in the gesture which many children characteristically use as a mand for being picked up, but Miss Simons simply continued to hold her hands out until Karen touched them. Back on the horse, Karen now rocked without Miss Simons's singing. Once again, she dropped her doll and the same episode was repeated. This time Miss Simons supported the behavior slightly less than she had on the previous occasion.

Next Miss Simons placed the doll on a couch about fifteen feet away. Karen stopped rocking for a few seconds while she looked at the doll, but then began to rock again, and after about a minute Miss Simons picked up the doll, attracted Karen's attention by tapping it, and sang in rhythm to the tapping. Karen made some sounds and began rocking the horse in the same rhythm, possibly in response to the tapping. At this point, Miss Simons returned the doll. Karen had been away from it for over a minute without crying. However, the next time Miss Simons took the doll away and placed it on the couch. Karen began to cry even though she continued to rock. Miss Simons sang in rhythm to the rocking and the crying stopped. At this point, Miss Simons herself took Karen off the horse, and they walked over to the sofa where Karen picked up the doll and sat on Miss Simons's lap. A minute later Karen indicated some disposition to get on the horse again by tugging on Miss Simons. Miss Simons did not take her to the horse, but instead picked her up and hummed to her as she carried her about. Several times Miss Simons picked up Karen, smiled, and sang to her, but she did not place her on the horse.

The whole interchange lasted about 30 minutes during which several hundred reinforcements altered Karen's repertoire substantially. In contrast to food reinforcement, in the usual animal experiment, very simple features of the child's environment were manipulated very skillfully and rapidly in a symphony of action. Even though these behavioral processes were the same ones that I knew from animal and human laboratory experience, I discovered many new ways to control and influence the behavior of these children as I observed this and similar episodes. Although I saw applications of every principles of behavior I knew, there was a content here that could not come solely from laboratory experience. I could make a functional analysis of the interaction, but I could not have designed it.

Note the unusual way in which Miss Simons weakened the doll's compulsive control of Karen. She waited until Karen's behavior was strongly controlled by other reinforcers so that she could remove the doll for brief periods. She very slowly lengthened the intervals during which Karen was without the doll by pacing them with the development of these other behaviors. At no point during the intervention was the frequency of crying decreased in the way that we carry out extinction in an animal experiment. With my limited experience with children I might have kept Karen on the horse until her crying stopped before I handed her the doll or lifted her off. When Karen dropped her doll and began to cry, Miss Simons reacted immediately and used the doll itself as the reinforcer for generating a small increment in the child's repertoire. Instead of simply carrying out extinction Miss Simons identified the operant reinforcer maintaining crying and began to apply this reinforcer differentially in favor of behaviors, other than crying, which she judged to be more useful for the child. The by-products of the reinforcement of other behaviors. In the meantime, the amount of crying and emotional states were kept small enough so they did not disrupt the new emerging repertoire.

It was not practical to interact with Karen on the rocking horse all day, so Miss Simons anticipated the next step by decreasing the frequency of performances on the rocking horse at the same time that she supported Karen's behavior in another way. For example, when they were sitting on the couch, Miss Simons did not reinforce Karen's gesturing toward the rocking horse. Instead, she picked her up and interacted with her via body contact and singing. I don't know what Miss Simons would have done if Karen had struggled in her arms and continued gesturing toward the horse. I suspect that Miss Simons already had gauged the probability of this when she shifted the reinforcer. In many other instances it appeared at first glance that primitive behavior was being reinforced. But after more observation I discovered that extinction was being carried out in a new way.

Another example is a boy who teased Miss Simons by pulling her hair. When Miss Simons continued to give him her full attention, I wondered why she didn't simply withdraw, since it was so clear to me that the annoying behavior was reinforced by her attention. But when I looked more closely I saw that Miss Simons was holding the boy's wrist close to her hair so he couldn't really pull it. Furthermore she released her grip on him only when his performance shifted in a direction that she wished to reinforce. This was another example of decreasing the frequency of a performance by finding another that would be prepotent over the one that was annoying. In this case the reinforcement was negative, the removal of the restraint she applied.

Miss Simons was amazed at how closely she was able to see herself in the notes describing her interaction with Karen. "Charles," she said, "I don't see how you can understand therapy, it takes years of training to do this." But I did have clinical experience even though it was with infra-human organisms. In my animal experiments I dealt with each subject as an individual. During the course of the experiment the conditions were changed continuously in pace with the subject's performance. I learned the fine grain of my organism's behavior, and as an experimenter I responded to the details of it. Rarely was an animal too deviant to work with. I always looked for the factor responsible for each animal's uniqueness and tried to take it into account. Each pigeon differed in how much grain was necessary for reinforcement to maintain an adequate amount of behavior. The height of the key or lever had to be adjusted for the size of the animal, and the transition from one schedule of reinforcement to another was always a unique affair, carefully adjusted to the animal's current performance, even though the general form of the final performance was common to all of the animals. Each animal was different in many ways and the goals of the experiment was to find a common factor beyond the individual characteristics of each subject.

The observations that I made were not solely for my benefit. Miss Simons's amazement at my close description of her encounter with Karen came partly because of the difficulty she had in conveying her procedures to other people. Despite Miss Simons's consummate skill with the children, other staff members fell far short of the mark, and they did not learn simply by watching her. Nor was she able to instruct them verbally. Terms such as "keep your antennas out" or "watch for the health in the child," often eloquent descriptions for those of us who appreciated a fine grain analysis of behavior, did not help the staff in actual procedures with the children.

Perhaps a quotation from a recent talk by Miss Simons will suggest the impact a technical language about behavior has had on her work. 'I think I can explain little step-by-step procedures now so that people don't just look blindly at me with awe. I'm not even sure intuition is so mysterious. I think it's having eyes all over the place and seeing the tiny little things that children are doing and then suddenly the child reacts to it. And I am able to see the tiny little steps and explain much better what I am doing with the children so the magic is out of Linwood--which I think is wonderful.' Now she has an objective language that is simple and concise enough for everyone to understand. To supplement Linwood's magic there is a training program in the experimental analysis of behavior. It is a key part of the project. The course is designed to make more inventive and effective therapists and we constantly experiment with ways to improve it. The main emphasis is on a detailed technical analysis of animal behavior, because we have found that facility and skill in the fine grain technical description of animal behavior makes it possible for therapists to systematically observe the details of the complex natural environment.

The DRO, differential reinforcement of other behavior, is an example of animal data and procedures which influenced almost every therapist who took the training course at Linwood. In the context of DRO, they understood how Miss Simons weakens primitive behavior by positively reinforcing other performances.

The functional analysis of her interactions with the children also changed Miss Simons's practices. As she became more self-conscious about her own activities, she saw more clearly which parts of her complex interchange with the child were having particular effects and, accordingly, refined her activities and increased the frequency effective contingencies. Small, hour-by-hour increments in the child's repertoire became reinforcers for her as she learned to observe the fine grain of the interaction with a child.

Another consequence that came from learning a systematic language about behavior was an increased ability to design new ways of activating the child's environment. Reinforcement theory and a technical analysis of verbal behavior have led to new procedures in the schoolroom never before used at Linwood. For example, children are now taking part in classroom educational activities who have never done so before. Part of the reason for this has been the use of chains or sequences of behavior so that a child goes on to the next activity such as writing when he demonstrates that he can read a short text perfectly.

In summary, I want to describe how the clinical staff at Linwood and I have modified each other's behavior. In general we have found less benefit from literal methods from the animal laboratory than we have from a systematic and objective description of behavior. A systematic language about behavior allows the clinic to use its own special knowledge and experience more effectively.

> At first the Linwood clinicians feared conditioning because they thought of the usual laboratory situation where the experimenter determined the behavior to be developed. When they thought of applying operant conditioning to children, it appeared arbitrary, immoral and at the expense of the child's development. They discovered, however, that they, with their intimate clinical knowledge of the child, still decided what behaviors were to be developed. Principles of conditioning simply aided them in working more effectively.
>
> From my point of view as an experimental psychologist, the reverse lend lease has provided "grist for my mill." The phenomena I dealt with in the animal laboratory now are a design in an actual fabric and I find many theoretical challenges in our frequent discussions and observations of the children."

Accomodating Experimental and Clinical Needs

Preliminary discussions which Jeanne Simons and C. B. Ferster carried out to formulate a project proposal were frequently concerned with all of the unforeseen demands that the project would make on both the Linwood and project staffs. It was clearly impossible to structure the project in advance. Stresses, strains and work demands would be surmounted only by the common goal held by the project principals which would shape their conduct through unforeseen problems. Jeanne Simons had many reservations and fears prior to the project. She worried about the possibility of investigators manipulating the treatment center to get their results with little regard for its ongoing goals and purposes. She worried that experimental psychologists would have little feeling for the people involved and that they would want an experimental result at the cost of treatment. C. B. Ferster also worried about the achievement of his goals--that the project might be lost in the practical details of the treatment center.

The first experiment which was carried evolved into a collaborative style which illustrated the way the clinical and experimental aspects of the project accommodated and interacted with each other. The experiment was designed to enlarge the repertoire of a seven-year-old mute autistic boy with a token which the child would need to gain entry into the dining room. The plan of the experiment was to allow the child into the dining room only if he gave a plastic disc to the person at the door. Initially, he was handed a disc just before he reached the entrance and simply had to surrender it in order to gain entrance. Later, he was given the disc some distance away from the dining room and some time before the meal so that he had to retain possession of the disc or remember where he had left it. Finally, the disc was to be used as a reinforcer for simple tasks, such as putting two interlocking blocks together. The complexity of the task was to be gradually increased in successive approximations. The following notes written September 1964 at the start of the project, showed the lack of clinical judgment in the initial approach to experimentation at Linwood.

> "The other person will bring George to the meal. Just before he enters the room we'll hand him a poker chip. The person inside the room will be at the threshold and will take the poker chip from him as he comes in. If he doesn't have a poker chip he will not be admitted. If necessary we'll skip the meal. If he refuses to give up the poker chip when he comes in we will not force this from him but simply not allow him to enter until such time as he hands it over. If he doesn't hand it over at all, we'll skip the meal. When we get to shaping a performance with the token as a reinforcer the conditioned reinforcer that will be used will be "good boy," said in a lively tone of voice like, "Good boy, George!", "Atta boy!" The procedure was used very effectively in pigeon experiments with matching to sample. Each time the bird matches the sample correctly the lights on the food dispenser flash but food is only delivered, say, every 10th time the bird matches correctly. Perhaps it will be useful to deliver the hugging and full physical and social interaction on a fixed-ration schedule in which each correct performance leads to "good boy" but only every fifth one leads to an extended interaction, in which he could sit on a lap, be hugged and otherwise approved of. The same schedule of reinforcement could be used with eating if there were some consequence of completing the meal in addition to the ingestion of food. To do this the amount of food given in the meal needs to be judged carefully, beginning such small amount that we can be sure he can finish the meal. When he completes the last bit of food on the tray, there is some further consequence which does not occur at such time when he doesn't finish all the meal or all the food on the tray. We can then gradually adjust the amount of food we give upward until we have a reasonable amount of food which we know he can finish consistently."

The experimental procedure was a clear simple one which might interact with simple performances which, once established, could be elaborated. On the other hand, the account was clinically naive because it used stimuli as reinforcers which had little reference to George's actual repertoire and disposition. The assumption that hugging would be a reinforcer could have easily turned out to be incorrect. A better approach would have been to watch George, interact with him tentatively and determine empirically what kinds of events would increase the frequency of George's performances. Not only would a tentative procedure, paced to the boy's current capability and needs, have produced a stable reinforcer it would have also discovered performances already in George's repertoire which could have been strengthened and elaborated. The same kind of clinical error was expressed in the next part of the experimental notes.

> "We have the problem of the possibility that Goerge may be more disposed to sit and eat or engage the experimenter by sitting on his lap, walk about the room, poke at him and so on. The way to handle this is reduce the frequency of these behaviors by not reacting to them. If he tries to sit on your lap, simply stand up and be as non-reactive as possible. Now, the effectiveness of this depends on being extremely reactive, friendly, engaging the boy verbally and smiling, while he is engaging in behavior reinforced by the token procedure. If this alternate reinforcement and extinction is carried out consistently, the interferring behavior will soon decline in frequency. The fixed-ratio schedule reinforcement by cuddling will also be helpful in putting the various behaviors under the control of the appropriate stimuli. Rather than get rid of behavior, put it under the control of the occasion when it is appropriate. If there is a durable performance, there must be a durable reinforcer maintaining it. To use such a performance and reinforcer effectively, they need to be under the control of a stimulus so that they can occur appropriately. Thus cuddling and dealing with the experimenter should be limited to the occasion when the experimenter reinforces. The fixed-ratio reinforcement by cuddling supplies the conditions for putting it under stimulus control. The child's requests for cuddling are ineffective except on the completion of the fixed-ratio requirement. In this way we preserve cuddling during reinforcement, yet reduce its frequency on other occasions where other performances are more important."

The principals enunciated in the experimental notes were correct: To reduce the frequency of one performance carry out extinction while increasing the frequency of another. Any strong behavior is potentially useful as a reinforcer or an appropriate occasion. An important way to decrease the frequency of a competing performance is to reinforce it only on specific occasions. Yet the clinically valid application of these principles was impossible without much additional information. The experimental plan focuses on the performances to be reinforced by the token and its later relation to food and cautions against the possibility of other kinds of conduct interferring with the development of the arbitrary performances. Yet the performances that are viewed as interferring with the experimental plan were the very experiences which were therapeutically important.

The experiment proceeded, despite some of its clinical shortcomings, because of Miss Simons's confidence that the experimenters would adjust their conduct to the results of the experiment as it proceeded. The major problem took care of itself without any need for specific redirection from Miss Simons. George began teasing the experimenters. When the task simply required that two blocks held in position by the experimenter be pushed together, George rearranged the blocks before he squeezed them so they couldn't interlock. Then he would run around the room, turn lights on and off, giggle at the experimenter, smear spit from his hands to the experimenter's clothes, get the experimenter to chase him by leaving the room and a host of other performances whose high frequency appeared to be due to the way they confounded, annoyed and perplexed the experimenter. Through successive stages of the experiment, the frequency of the teasing and other personal interactions with the experimenter increased until periods as long as 45 minutes and seldom shorter than 15 minutes were needed to complete a task, which could have been done in seconds. Coupled with this large increase in the frequency of this primitive social behavior was a large number of instances where George missed his meal altogether when he exceeded the time that was allowed.

George had few and fleeting relations with people prior to the experiment and the token experiment produced the situation in which he enjoyed playing with the experimenter more than working with the token. The token procedure, under these conditions, put George to a disadvantage for having a new rewarding human relationship because he missed his supper if he played with the experimenter. After discussing the problem Jeanne Simons and C. B. Ferster decided that the way out was to play with George before the experiment began. Thus the experiment would not be the instrument for depriving him of his newly found human relationship.

The next incident, however, brought the clinic and laboratory to the point where a critical decision had to be made. On a particular day when George had not yet completed his task William, noticing his absence from the lunch table, asked Miss Simons why George was not eating. He was obviously concerned about the number of lunches that George had recently missed. When Jeanne Simons said that George had not yet done his job, William said, "Me help George." Jeanne Simons in recounting the incident later, told how she faced a dilemma at this point. If she let William help George, she would be interferring with an experiment. If she didn't allow William to go, she would violate all her instincts as a therapist. William, an autistic child only recently verbal, was showing a concern for another child, a tendency which was to be encouraged if possible. George, a generally ignored and unloved child by both adults and children was about to be the recipient of attention from one of his peers. Therapy, of course, won out and William and George interacted over several days with an obvious gain for both of them. The by-products of the token procedure were not lost on Jeanne Simons and fortunately the experimenters did not take any action to discourage them. William helped George immediately, doing most of the task for him. Then both went to the dining room to eat. At a later session, Jeanne Simons told William that George needed to do most of the task, putting two blocks together, by himself. Therefore William was also given two blocks with which he demonstrated the task to George. The way William adjusted the task slightly from session to session as the experimenters had done, showed his newly formed identification with the project. For the next few days William demonstrated and George did the task. Later George began playing and teasing as he had done with the previous experimenter when and as a result it took George longer to complete the task. The teasing continued about four days when William said, "George, me hungry. Me want supper. Do it." And he went to the dining room leaving George behind. Other evidence for William's new identification with the project was the way William changed the task slightly from session to session, just as the experimenters had done.

The incident proved the value of the early discussion and understanding. C. B. Ferster very quickly saw the therapeutic necessity of the interaction between George and William, and became interested in studying and analyzing the social behavior rather than the token procedure. The application of reinforcement principles became considerably broader than the immediate performances whose frequency could be increased by following them with a token.

Despite the clinical limitations of the token experiment, it had considerable indirect benefit to George and carried some lessons for the therapeutic goals of Linwood. The token procedures had dramatic effects on the boy's behavior at each stage of the experiment. Initially, the simple requirement of having to keep possession of the token for entrance into the dining room produced enormous tantrums and primitive compulsive behaviors, when, for example, he appeared at the dining room without a token and was denied access to the meal. A continuous decline in whining, crying and general atavistic behavior was an important by-product of the procedure. The arbitrary requirement of a token produced an opportunity to produce primitive behavior in circumstances where it would not influence anyone. At the same time there was sufficient latitude in the experimental procedure that George could tease and manipulate the experimenter short of a tantrum. When tokens were given as a result of a performance there was again considerable negativisms and tantrums. But maintaining the requirements without reacting especially to the primitive behaviors reduced their frequency as before. The token procedure had two results. First, there was the positive gain of a constructive interplay with the token and the personal reactivity of the experimenter. Second, requiring George to conform to a structured environment gave an opportunity for weakening the primitive behaviors which characterized a large part of this boy's repertoire in favor of other kinds of conduct. During the ten weeks of the experiment, the boy's mood improved throughout the day to the point where he seldom whined or cried. He smiled and vocalized a great deal, even though he still did not talk. Interpersonal relations, although primitive, increased dramatically. Apparently, the successful manipulation of the experimenter through the token procedure extended to the rest of the Linwood staff who George now began to tease.

The following notes, over the next six months illustrates the blend of the token procedure with the Linwood clinical approaches.

March 16, 1964

> Two weeks after the beginning of the experiment George is now working on the teaching machine getting a plastic disc every time he pushes the correct button on the matching to sample task. Although the disc is the same kind that was used in the token experiment, the tokens have no other significance than the noise they make when they come out of the automatic dispenser and their indication of a correct choice. George's level of social activity elsewhere has increased to the point where it seems advisable to stop reacting to it on the more inappropriate occasions. The session with the teaching machine is now terminated when he starts to tease.

April 20, 1964

> George went through the series of activities that he completed daily--placing dominoes on the card with the corresponding number of objects, putting a puzzle together, followed by an opportunity to use the teaching machine and then the token which was required for entrance to the lunch table. As an afterthought, he was allowed to put a record on the phonograph, which he listened to clapping his hands in rhythm to the song.
>
> George had just begun his puzzles with Jeanne Simons when my entrance disturbed him. Jeanne Simons

> took him by the hand after he had wandered away from the table where he was working on the puzzles, led him back and guided him through all of the remaining activities. That George could be guided through the activities with this slight pressure is quite a change in his repertoire. When George first began structured activities no amount of constraint, reward or coercion would get him to put two Lego blocks together. Now, the social control gently exerted by Jeanne Simons very effectively sustains his performance on the puzzles and overcomes the distraction by the visitor. This is the first time that George has shown this degree of structured activity under social motivation.

The mutual accommodation illustrated by the token experiment with George was a prototype of the kind of mutual adjustment that occurred continuously during the next three years of the collaborative project. The final complex social performances that were generated by the token procedures could not have been achieved by either the clinical or the project staff staffs alone. Each of the procedures was shaped by the other. The token procedure generated an environment which would have gone unnoticed by the project staff had the clinical environment not been sensitive to and reactive to all of the collateral aspects of the token procedure. The result was a personal learning experience for the project staff which took them in slow stages from their structured well-defined techniques of control, toward an appreciation for new phenomenon they had not previously taken into account. The clinical staff had the benefit of a deliberate and rational attempt to activate the social and physical environment. As a result of the partial success in bringing George to increased social contact they began to look for ways of deliberately increasing the reactivity of the social environment. The reinforcers that the clinical staff arranged tended to be natural rather than arbitrary. This distinction, implicit in the comparison of the performances generated by the token (putting two Lego blocks together) and the annoyance of the experimenter (teasing), is a basic one important to understanding the role of principles of reinforcement in clinical treatment which will be elaborated in Chapter 3.

STAFF AND DEVELOPMENT OF THE PROJECT

The first discussions about the Linwood Project between C. B. Ferster and Jeanne Simons began in the summer of 1964 and the pilot experiments with Linwood children such as the token procedure that was just described began in the fall. Dr. Kathryn Schultz, the Medical Director of Linwood, was present during many of these discussions and took an active part in determining the early form of the project. By November 1964 the basic plan of the Linwood Project had emerged and an application was made to the Norman Fund by C. B. Ferster for a small grant with which to begin a pilot program and develop a plan for a three-year project. The

Norman Fund approved the request in December 1964 and these funds allowed the pilot experiments at Linwood and the preparation of a formal proposal to continue. The three-year proposal was funded by the Office of Education beginning in June 1965. Dr. John Cameron joined the project at this time as Project Co-Director. The people who carried out the project fell into three categories. There were the principals of the project C. B. Ferster, John Cameron, Jeanne Simons and Kathryn Schultz. There were those who primary duties were the therapeutic care of the children and those concerned with the training programs and the introduction of new procedures into the Linwood structure.

Project funds supported approximately four persons who had continuing clinical responsibility for the children. These people were under the direct supervision of Jeanne Simons, the Director of Linwood. The remainder of the project staff was responsible for the direction of their work to the Project Director. Their supervision shifted to Jeanne Simons when their work required them to work directly with the children, as for example, when they developed a new teaching procedure or experimented therapeutically. C. B. Ferster, the Project Director, designed most the major points of entry into the Linwood environment and supervised the day-to-day activities of the entire project staff with the exception of those whose responsibility was the day-to-day care of the children at Linwood. Dr. John Cameron whose background included a wide range of practice and theory in psychoanalysis and the treatment of psychotic adults participated, with Dr. Kathryn Schultz, in the continuing discussions about the broad planning decisions of the project. His experience as a clinical psychiatrist gave him a special role in taking account of the group structure of Linwood and the project when the changes were proposed or implemented. Jeanne Simons as Director of Linwood and Kathryn Schultz as Medical Director, were responsible for the management of the Linwood Children's Center including the treatment program supported by project funds. Miss Simons's unusual success and virtuosity as a therapist was a focal point of the project since much of the project activities were designed toward clarifying her procedures, describing them in objective terms, and the development of training procedures for communicating them to junior staff members and others.

Mrs. Susanne Mitchell, M.S.W., assisted Miss Simons and Mary Carol Perrott assisted C. B. Ferster. The following persons worked as part of the Linwood clinical staff at one time or another under auspices of the project: Ann Ditman, Rachel Goldberg, Harriet Goldman, John Kilchenstein, Marsha Koenigsberg, Karen Levy, Peter Plantec, Anna Singer, Nancy Tankersley, Inez Varela, and Helen Witkin. Mrs. Miriam Jaegerman, Mrs. John Randolph, and Mrs. Maria I. Rocha e Silva developed programmed materials and aided in the implementation of the teaching machine programs. By the development of programmed materials, pilot classroom procedures, teaching machine programs and actual teaching demonstrations, they created the nucleus from which the reinforcement procedures of the classroom grew.

Miss Ellen Smiley began her work on the project mostly with the production of programmed materials for use with teaching machines for the Linwood children at all stages of development. Later she served as a primary assistant in a pilot experiment (see Chapter 7) in which remedial experiences were supplied to two dislexic children. The experimental classroom was designed to apply principles of reinforcement to the overall classroom environment and it served as a prototype for the Linwood classroom. Following this experience she took charge of the Linwood schoolroom under the supervision of Jeanne Simons and continued further development of principles of reinforcement in combination with the clinical requirements of the classroom. Her presence in the Linwood classroom, with her strong competence in the experimental analysis of behavior, was of great assistance in the training of the schoolteachers who followed her. Therapists who worked with the younger, less-advanced children at Linwood also benefited from demonstrations of how verbal, conceptual and cognitive skills were created. Carl Schultz aided in the production of video-tapes during the last phase of the project. Mrs Evelyn Smith and Mary Jane Kessing provided clerical support for the project during the first year and Mrs. Howard Rohm was the principal secretary responsible for the general clerical management of the project as well as manuscripts and correspondence.

Mary Carol Perrott served as the principal assistant to the Project Director for the first two years of the project. A recent graduate of Denison University when she began work on the project, Mary Carol Perrott was the project's first evidence that training in the experimental analysis of behavior could prepare a person for work in a clinical environment. Her training in the experimental analysis of behavior from Denison University and its continuation on the project made it possible for her to learn the clinical procedures of Linwood rapidly, to observe and record the behavior of the children, the therapists, and the proceedings of staff conferences and to operate as the principal assistant of the Project Director. She started pilot projects in various areas such as the implementation of a particular teaching machine, development of a part of a reading program, observation of autistic children in the homes with the parents, and the various aspects of the training program including the empirical testing of the various texts which were written for the training program.

Mrs. Charlotte Farrand who joined the project during its last year had the primary task of implementing the training program in the experimental analysis of behavior at Linwood with the entire Linwood staff and integrating it with clinical material. She developed new training techniques and procedures for using the training in the science of behavior to learn clinical and practical skills. Once she had mastered the experimental analysis of behavior, her previous experience as instructor in the pre-school programs at the University of Maryland and her knowledge of normal growth and development and practical skill with pre-school children allowed her unusual rapport with the Linwood staff. She was able to identify with the practical day-to-day problems of dealing with children as well as appreciate how a scientific language about behavior increased her practical skills and her ability to conceptualize about children.

Dr. Leo Walder, Associate Professor at the University of Maryland, joined the project when we discovered the need for experimenting with procedures for altering the behavior of the parents in the home so that they could support the advances made with the children at Linwood. Dr. Walder's experiments led very quickly to a new project which was funded separately and expanded in scope.

Professor Fred S. Keller joined the project during July and August of 1966 to experiment with the development of a training program that could be used for summer counselors and persons whose educational development limited the kinds of formal academic training which was possible. Professor Keller returned to the project in June 1967 to consult on the implementation of the training program of Linwood and to write a formal training program titled, "A Personalized System of Instruction," designed to present the formal aspects of principles of reinforcement for sub-professionals engaged in therapeutic tasks. This program will be described in Chapter 5 on training.

Chapter 2

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CHAPTER 3

ARBITRARY AND NATURAL REINFORCEMENT

In a project applying principles of reinforcement to human behavior one of the first orders of business is a clear distinction between animal laboratory procedures and the operation of reinforcement principles in the normal human environment. As the previous chapter showed, it is not necessary that the application of general principles of reinforcement take the form of behavior therapy or literal analogues from the animal laboratory. The distinction between the operation of principles of reinforcement in animal experiments and their use in the solution of clinical problems is the topic to which this chapter is addressed.

An important dimension of a reinforcement, relevant to its clinical significance, is whether it is arbitrary or natural. Frequently when clinicians object to the extensions of animal principles to therapeutic settings they are implicitly reacting to the distinction between arbitrary and natural reinforcement. In general the arbitrary application of reinforcers characterizes laboratory procedures, particularly with animals, while natural reinforcers characterize the clinical situations as well as the normal milieu. The basis of the distinction is an important one because it enables one to distinguish between uses of principles of reinforcement which are clinically useful and those which are not.

Although the distinction between arbitrary and natural is most important with positive reinforcement, it will be helpful to the reader to introduce the distinction by describing control by aversive stimuli --negative reinforcement.

ARBITRARY AND NATURAL REINFORCEMENT IN AVERSIVE CONTROL

Negative reinforcement, escape from an aversive stimulus, is very common and necessary in the natural human environment because aversive stimuli occur so widely and frequently. Anytime there is an aversive stimulus, there is potentially some performance which will terminate it. In bright sunlight we put on sunglasses, shade our eyes with our hands, turn away from the sun, or reduce the amount of light by squinting. Such aversive control obviously does not have drastic side effects, nor is it unproductive or undesirable. Youngsters quickly learn to put their fingers in their ears when there is a loud noise. Visual aversive stimuli commonly reinforce the behavior of turning the head away. Performances such as opening a window, taking off clothes, or turning on an air conditioner occur because they reduce the temperature of the air around the body. A pebble rubbing the foot inside the shoe reinforces removing it. In the presence of extreme odors we pinch our nostrils or hold our breath momentarily. The examples of natural reinforcement by aversive stimuli can be repeated at great length (Ferster and Perrott, 1968). The necessity of aversive control in normal life is conveyed by a statement attributed to Thorndike that the zero point, the first level of intelligence and productive behavior, is spitting out a bitter substance that enters the mouth.

These simple aversive stimuli are natural rather than arbitrary because there are no restrictions on the kind of performance that is reinforced so long as it reduces the aversive stimulus. A performance reinforced by escape operates physically and directly on the aversive stimulus. For example, turning the dial of the television set blots out the commercial, or averting the gaze interrupts the light entering the eye. All of these behaviors have the same result on the aversive stimulus and they are equally effective in terminating it. The property of the aversive stimulus could be described theoretically by saying that it reinforces a class of behaviors. In most cases the aversive stimulus interacts with, and shapes, existing behavior. The particular performance that an aversive stimulus will reinforce will depend, of course, on the total repertoire the person brings to it. Bright sunlight will reinforce squinting or wearing sunglasses or a hat in the case of the person who needs to spend time outside. If a person is not disposed to spend time outside he can avoid the sun by staying inside or in shaded areas.

In contrast to the natural reinforcers there is the aversive stimulus which is applied arbitrarily by one person to control the behavior of another. Examples of this kind of arbitrary control are the child who picks up his toys because doing so terminates the parent's threat, a student who does an assignment because it avoids ridicule in class the next day, or an employee who does his job when there is a threat of being fired.

Such arbitrary social reinforcement differs in two ways from the natural reinforcer that was just described. First, the performance that is reinforced is specified narrowly in contrast to natural reinforcers where a large class of behaviors can get rid of the natural aversive stimulus. Thus, a parent who says, "Come here this minute or I'll get angry," requires one particular performance. The child cannot, for example, escape the parent altogether by leaving the room. In that case the parent will adjust the aversive stimulus until the only way to terminate it is to come immediately. The usual laboratory experiment with a rat, a lever, and an electric shock illustrates this same property of arbitrary reinforcement. The electric shock can potentially reinforce lying on the back, hanging from a projection on the wall or standing between the grids on the floor. Because the experimenter needs a performance that can be recorded automatically he arranges the apparatus and procedure so that only pressing the bar can terminate the shock. He shaves the fur from the rat's back, incarcerates him in a chamber, eliminates projections from the walls and uses closely spaced grids. From the rat's point of view all that is required is that the intolerable stimulus be terminated. It is the experimenter who has an investment in lever pressing. The parent who uses aversive control to get a child to pick up his toys is establishing the same arbitrary relationship to the aversive stimulus as the experimenter has done with the rat and the electric shock. The child cannot simply escape from the parent's anger as he could from a hot fire because there is no behavior in his repertoire which has any physical relation to the aversive stimulus. The parents require a particular performance and adjust the application of the aversive stimulus until they get it.

Natural reinforcement begins with a performance already in the individual's repertoire reinforced by an event which occurs reliably in the milieu. Procedures designed to influence this kind of behavior must therefore begin with the current repertoire of the individual. Arbitrary reinforcement does not need to take the individual's current repertoire into account nearly as much as is the case with natural reinforcement.

While we sometimes apply aversive stimuli for the individual's own good, the immediate reinforcers benefit only the controller. The controller gets the behavior he wants: the child temporarily terminates an aversive stimulus which a controller such as a parent can reapply any time he wants another performance. The reinforcement is arbitrary because there is no reinforcer currently maintaining the desired behavior or behavior similar to it in the child's repertoire. With an arbitrary stimulus, the controller can coerce a particular performance, whatever the child's current repertoire. A mute child under the control of a graduate student whose course grade depends on producing speech is in such a position. Speech which is arbitrarily reinforced without reference to the child's current repertoire may disappear as soon as the acute intervention ends unless there is planned transition to a natural reinforcer. Aversive control is often said to benefit the child because the behavior that is coerced will be useful to the child later. The child does not benefit, however, in the sense of achieving a durable reinforcer which will maintain behavior without the coercive control.

Another characteristic of control by an arbitrary reinforcer is that it is designed to preempt the rest of the individual's behavior. Thus, the child facing a threatening parent cannot turn to other behaviors as he could in the face of an aversive stimulus which had a fixed physical relation to his behavior. The requirement that he emit a particular performance will preempt all other behaviors.

The person who applies an arbitrary reinforcer intends to produce a particular form of behavior. In contrast, the motive for the natural reinforcer comes from the individual who terminates it. In a teleological vein, one might say that the natural reinforcer has no motive and will be satisfied with any performance that terminates it. As a result the naturally occurring aversive stimulus may seldom, if ever, occur if it is aversive enough to maintain the operant behavior that avoids it. Technically the immediate and specific behavior generated by the aversive stimulus reinforces the individual in the case of natural reinforcement. A child may escape and avoid a hot stove for years without being burned. The hapless rat in an experiment or the socially controlled child, however, will be re-exposed to the aversive stimulus each time the experimenter or parent wants some more behavior.

ARBITRARY AND NATURAL REINFORCEMENT IN POSITIVE REINFORCEMENT

The arbitrary control of behavior for the benefit of the contoller, rather the controllee, can occur in positive as well as negative reinforcement. This is most clearly seen in the typical animal experiment where the researcher is interested in obtaining a particular form of behavior and arranges all of the conditions of the experiment to produce it When the experiment is over the animal may be sacrificed without any concern about how the procedures affected the animal's life. The motivations of the parties concerned describe the same facts. The purpose of the experiment is to supply information for the experimenter rather than to allow the animal to acquire new performances useful to him. The performance that the animal emits in the typical experiment is selected to achieve a particular purpose for the experimenter. In the classical operant pigeon experiment, for example, the most commonly recorded performance is that of striking a small disc which in turn operates an electric switch. The closure of the switch provides an electric pulse to operate the food dispenser, make a record and program other aspects of the experiment. Such a performance is chosen because it is a natural activity for a bird, it is easily taught and may be maintained for long periods of time without fatigue, the bird can peck as fast as 15 times per second, successive instances of the performance do not vary very much because the form of the behavior is very natural to the bird, and finally, the record is automatic because of the switch behind the disc. These are the many reasons why the experimenter arranges an experimental space where he will be sure the bird will receive all of its food by pecking a key. The bird, however, left alone in the natural environment will feed itself in many different ways such as looking for insects and worms and seeking grain and other plant forms in many different places. To limit the bird's performance to the one way of getting food required incarcerating it in a small experimental space to make it possible to feed in any other way than pecking the disc.

There are as many undesirable aspects of arbitrary positive as there are of arbitrary negative reinforcement. The performances reinforced by the arbitrary positive environment primarily benefit the person applying the reinforcer rather than the individual acquiring them. Only one performance, specified by the person who reinforces, is allowed. In contrast to the arbitrary environment the natural positive environment does not adjust itself for a particular purpose and hence will react to any performance which produces the critical result. The open field is a natural environment because there are many different kinds of food in many different places which the pigeon may get in so many different ways. The bird may fly to a high tree and peck the fruit, he may walk over the ground eating worms, he may search for a field in which there is corn, he may chase insects, or may appear each morning at the door of a kindly lady who throws bread-crumbs out. The pigeon in an experimental space pecking at a disc for food would in most circumstances leave the box for other kinds of food were he not incarcerated.

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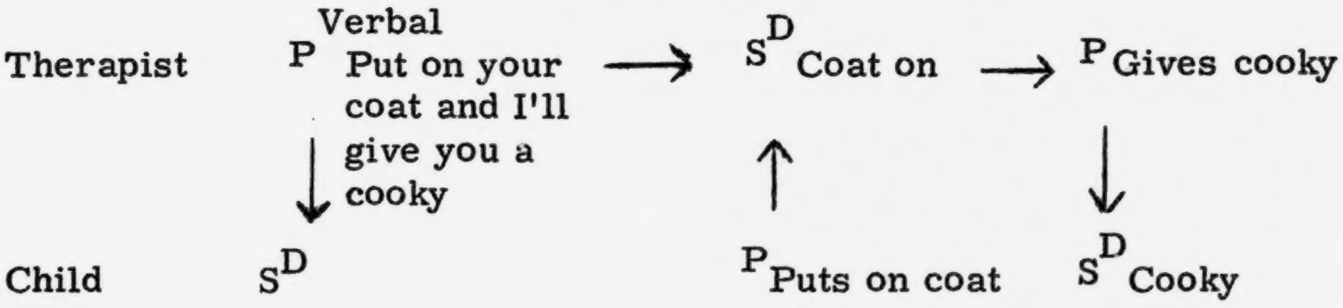
Even the natural environment, however, may be manipulated, perhaps through the principles of reinforcement without coercion or arbitrary constraints on the animal's repertoire. For example, although the birds do not usually over-turn or displace pebbles or small stones to look for insects such a repertoire could be developed by adjusting the environment by successive approximations. First, food would be placed under a light, flat stone so that it is visible from the side and could be easily plucked out from under the stone. In the course of plucking the grain from under the edge of the stone, the bird will occasionally displace the stone and uncover some grain (or insects) which had been covered by the stone. Increasing the weight of the stone on successive occasions would teach the bird to use his beak as a lever to move heavy pebbles which he could not have dislodged previously. Further training could teach the bird to distinguish those kinds of stones and locations under which insects are likely to be found and those which are not. Stones would be deliberately grouped so the bird experienced alternate success and failure depending upon their appearance. If the bird were successful frequently enough, he would continue to move stones frequently. Continued experience would teach him to distinguish one kind of stone from another. When the bird learns to select the stones with the food under them, nearly all of the bird's attempts will be successful and the performance will likely be stable. The procedure is natural rather than arbitrary because the experimenter did not actually deliver the reinforcer. He simply rearranged the environment to bring the bird in better contact with events which would continue to occur naturally. No further attention from the experimenter or teacher would be required to sustain such a repertoire because its reinforcement occurs in the natural environment rather than by the arbitrary action of the experimenter.

The individual's current repertoire is the starting point in natural reinforcement. Even in arbitrary reinforcement, however, it is necessary to be extremely sensitive to the animal's current repertoire. It is virtually impossible to predict in advance the successive approximations that need to be reinforced in order to produce the final complex form. Even in shaping a pigeon's behavior, the unique repertoire he brings to the situation determines the stages through which the final performance will be developed. A very successful way to shape performances in an animal is to patiently reinforce almost any behavior the animal is currently engaging in. The change in the animal's performance comes from slight changes in the experimenter's inclination to reinforce one form rather than another. At any moment it would appear that the experimenter is reinforcing almost any performance the animal emits.

ARBITRARY AND NATURAL REINFORCEMENT IN THE CLINIC

Natural reinforcement typifies the kind of procedures and methods which are found in a clinical treatment center because it begins with a performance already in the individual's repertoire reinforced by an event which occurs reliably in the child's milieu. Clinical procedures must necessarily begin with the current repertoire of the individual and the actual environment maintaining it. Arbitrary reinforcement, in contrast and by definition, does not need to take into account the individual's current repertoire nearly as much as in the case of natural reinforcement. The distinction between arbitrary and natural positive reinforcement becomes of practical importance when the child needs to develop performances which will allow him to function outside of the therapeutic or experimental environment. One such performance, putting on a coat, is a simple illustration of the distinction between arbitrary and natural environment in a clinical setting. The arbitrary case is illustrated in the diagram below.

ARBITRARY CONTROL

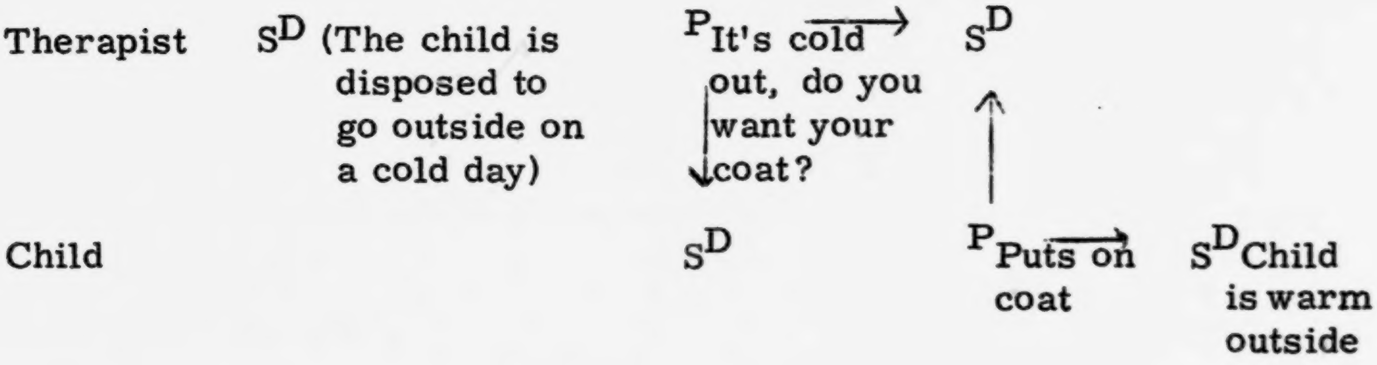


The behavior of the therapist, indicated on the top line, describes the verbal performance, "Put on your coat," reinforced by the appearance of the coat on the child. The dressed child is the occasion on which the therapist gives a cooky, a performance which is reinforced by the subsequent frequency with which the child puts on the coat in reply to the repeated instruction. The child's behavior is outlined in the bottom part of the diagram. The performance of putting on a coat leads to a cooky whenever the therapist instructs the child to put on his coat and promises a cooky. The child therefore will put on his coat when two conditions are met: an instruction from the therapist, including a promise of a cooky, and the delivery of a cooky each time the child puts on his coat. The child begins with little disposition to put on his coat but a disposition to eat cookies. The therapist's performances are reinforced when the child puts on its coat but not necessarily when the child eats cookies.

The last arrow in the diagram indicates the arbitrary nature of the control. Without this arrow (the food), the interaction between the child and therapist is unstable and both of their performances would disappear. The child's performance would disappear because putting on the coat would no longer be followed by the critical event which maintains its occurrence and the therapist's verbal performance would disappear because it would no longer induce the child to put on his coat. There is no environment, other than the special one of the therapist, which would continue to reinforce putting a coat on.

The same performance, however, could be reinforced naturally if the coat served to prevent the child from being cold outside. This situation is illustrated in the diagram below.

NATURAL CONTROL


Therapist
S^D (The child is disposed to go outside on a cold day)
^{P}It's cold out, do you want your coat?
S^D
Child
S^D
^{P}Puts on coat
S^DChild is warm outside

The behavior of the therapist is indicated on the top line as in the previous diagram. On a cold day, when the child is disposed to go outside, the statement about putting on a coat is reinforced by seeing the child put on his coat, as before. The child's performance on the bottom line, however, is reinforced by the change in temperature it produces around his skin when he goes outside rather than a change in the behavior of the therapist. The major differences between the arbitrary and the natural case may be seen in the bottom line and in the absence of the last arrow. Once the child puts on his coat and avoids being cold, the performance is in the child's repertoire without regard for the motivation of the therapist. Although the therapist influences the child's behavior profoundly if the suggestion leads the child to put on the coat before going outside he does not control the child's behavior completely in the sense that food reinforcement does in the arbitrary application of reinforcement. The suggestion that the child put on his coat will only be effective in producing and sustaining a performance if the child is disposed to go outside and remain warm.

Not only will a natural reinforcer sustain a performance stably, but as with the example described earlier of the bird turning stones for insects, it may also selectively reinforce the critical parts of a repertoire or successively approximate complex performances.

The child may stand still and extend his arms when the therapist puts the coat on the child on a cold day before going to the play ground. In this situation the child is already emitting a performance, extending his arms, which is negatively reinforced (at the end of a chain of performance) by avoiding cold air outside. Under these conditions, the therapist may gradually assist the child less, paced with the child's ability to complete the task of dressing. For example, at one stage the therapist might hold the last sleeve in position until the child pushed his arm through. The completed repertoire will be natural in the sense that it will be durably maintained by its effect on the child's comfort long after the therapist has gone (Ferster and Simons, 1966).

Power Struggle

One of the difficulties that sometimes come from the use of arbitrary reinforcement is an interaction between the therapist and the child which Jeanne Simons calls a power struggle. This is a situation where the emphasis shifts from the therapeutic purpose to a struggle of wills, no holds are barred to get the child to do something despite his inclinations to the contrary. The following is an example of a power struggle:

Jim takes his shoes off and throws them across the room. Therapist: "Go pick up your shoes." Jim: "You do it." Therapist: "You pick them up." Jim: "You do it." Therapist (desparately): "Jim, for the last time will you pick up the shoes." Jim: "You do it." At this point, the therapist puts on Jim's shoes. In this case Jim won the fight fairly easily. To win the struggle the therapist would have needed to persist further in trying to get Jim to put on his shoes. The incident is an example of arbitrary reinforcement because the command to put on your shoes was aversive stimulus which Jim could terminate by putting them on. The therapist was not willing to increase the aversive consequences so that their removal (negative reinforcement) would produce the required performance so he (therapist) dropped his demand.

The struggle might have become more apparent if the therapist persisted in his demand that the child put on the shoes. Therapist: takes the child's hand and pulls him over to the shoes. Jim: holds back, struggles, kicks. The level of aversive control is escalated and it reinforces new performances, designed to terminate the new aversive stimulus. If Jim's struggle thwarts the attempt to drag him to the place where the shoes are, the struggle ends but now after performances of greater intensity than before. If the therapist is strong and persistent enough to overcome the tantrum, then the struggle reaches the next step. After Jim is dragged to the vicinity of the shoes, he will run away each time the therapist relaxes his grip. If the therapist holds firmly and attempts to put Jim's hand on the shoes, Jim will make a fist. This maneuver shifts the struggle to a new performance, getting Jim to open his fist. Through all of this Jim will lose no opportunity to be as aversive as possible in order to prevent the therapist from continuing the interaction. He will bite, scream, break any object his hand contacts, injure himself, or tear or soil the therapist's clothes. At each stage of the struggle the therapist is applying an aversive stimulus designed to produce a performance that terminates it. What started out as a mild command, turned into an assault on the child with increasing force. Eventually the therapist if he has the will to win finds some level of force which will achieve the performance. In the process, however, he successively approximates performances in the child whose only function is to escape from coercive control. As a result, paradoxically the therapist's own conduct teaches the child more vigorous ways of fighting which require a more severe assault on the child.

Example of a Power Struggle

The main reason that arbitrary reinforcement leads to a power struggle is that the motive for the child's behavior lies in the needs of the experimenter. Once it is the experimenter who requires the behavior rather than the child, the control of the situation shifts over to the child who can tease and obstruct the experimenter by withholding the behavior. In many situations withholding the behavior may have as big an effect on the experimenter as giving it to him, and obstructing the experimenter may be a more effective reinforcer (negative) than the reinforcer applied to produce the behavior that the therapist requires. The child's control of therapist's behavior is the factor escalating the amount of force that the therapist uses. The natural environment, on the other hand, is likely to avoid such power struggles because reinforcement is independent because the child is impelled by the consequences of his own behavior without any connection to the therapist's wishes, needs and motives. Once the therapist requires a particular performance from a child, however, he shifts the control of the interpersonal situation to the child, who now has an effective reinforcer for manipulating his behavior. The consequences of a power struggle may be serious for both child and therapist because the child reinforces behavior in the therapist at a level of primitiveness comparable to the child's own repertoire. Freudian primary identification also describes the interrelation in such a situation.

Some of the therapeutic methods used to avoid a power struggle will be described in Chapter 5. The distinction between setting limits and arbitrary reinforcement will also be discussed there.

Other Examples of Natural Reinforcement in the Clinic

There are many opportunities for the therapist to interact with performances which exist in the child's repertoire because they have a natural and stable effect on the child's environment. These situations are illustrated by phrases such as "If you want to leave the room, you need to turn the knob," as opposed to "you can have a cooky if you put the puzzle together." In the first case, the child already has engaged in the behavior of leaving the room reinforced by the new location he goes to. The therapist can successively approximate new behaviors such as turning the knob, speaking to someone or getting a key, by minor prompts and supplementary supports which then can be faded away. Such behavior is for the child's benefit rather than that of the therapist in the snese that the therapist has brought the child into better contact with a reinforcer that is already maintaining the child's behavior. New enlargements of the child's repertoire such as turning a door knob will, of course, make it possible for the child to come under the control of new reinforcers not currently maintaining his behavior. Opening doors is a repertoire which can lead to other reinforcers than those originally supporting the behavior.

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A few more examples of behaviors maintained by natural reinforcers, drawn mostly from Jeanne Simons's work with children at Linwood, will give the reader a further opportunity to examine the characteristics of natural reinforcement in still other contexts. Jeanne Simons, in offering a young autistic child a piece of candy, extended a jar with the lid on. The first time that she did so, the lid was laying on top of the jar so that the child had merely to displace it from the opening to get the candy. The next time the cap was screwed on about half a turn and on successive occasions it was fastened more securely until the child learned how to unscrew it. On successive occasions the child learned how to unscrew the cap. Here the reinforcement was by food but it was natural because the performance that emerged was one which would be repeatedly reinforced in many environments and possibly extended to other reinforcers than food.

Many other performances reinforced by food are examples of natural reinforcement despite their dependence on food and food deprivation. For example, asking for food at the table or using a spoon to eat difficult food such as pudding or ice cream.

The interaction between Jeanne Simons and Kathy on the rocking horse, described in the preceding chapter, contains many examples of natural reinforcers. The performances that took Kathy on and off the horse remained in Kathy's repertoire whether or not Jeanne Simons is disposed to get Kathy to climb on or off the horse. Jeanne Simons's role in these performances was that of providing partial supports, sucn as letting Kathy lean on her hands and helping one of the feet over the saddle, which made possible the final result. Rocking the horse, reinforced by Jeanne Simons's rhythmic singing is an intermediate case. The reinforcer is arbitrary because rocking leads to rhythmic singing only when Jeanne Simons is present and disposed to get Kathy to rock. The reinforcer that will eventually maintain rocking is the motion that it produces. In fact, Kathy continued to rock the horse even after Jeanne Simons no longer sang in rhythm to the horse movements. There were probably very few undesirable consequences of the arbitrary relation between Jeanne Simons's singing and the rocking of the horse because there was no coercion. Jeanne Simons would have reacted in almost any way that would have influenced Kathy and toward almost any performance that Kathy was inclined to engage in.

Another illustration of natural reinforcement occurred when several older boys, extremely withdrawn, and too large and old for the

Linwood environment indicated in their play a desire for a place to hide. The youngsters had progressed socially, become friends but little progress was being made in their school activities. They were barely at the first or second grade level. Their desire for a place of their own suggested to Jeanne Simons that they might build a cabin (with the help of a carpenter). The boys were enthusiastic and during the year the cabin construction continuously provided powerful reinforcers for schoolroom activities. They needed to apply for a permit, order materials, compute costs, visit stores, go over plans and take part in the construction. At every stage, the progress of the construction was made to depend on their verbal involvement.

The therapist's role in this interaction was to fill in some of the intermediate steps so that the boys' performances could be sustained. The final goal as a reinforcer was not attainable with the kind of repertoire that the children had. The task needed to be broken down into components which were small enough so that the children could succeed each day. Other collateral support was needed to keep the boys at the task. The episode continued through the whole winter since the construction was begun in the fall. At each stage there was always something concrete to which the school work could be related. At some points it might be computing the amount of nails needed. At another stage they might need to read something. The youngsters actually assisted in the construction. The result was an actual cabin which is still in use at Linwood for arts and crafts center and for overnight sleeping. Six bunks are used for children to practice going on overnight camping trips.

Arbitrary and Natural Reinforcement in Verbal Behavior

When Skinner describes the mand and the tact in Verbal Behavior he makes the same distinction as arbitrary and natural reinforcement. The mand, a verbal performance whose reinforcement depends on a level of deprivation in the speaker, shares many of the properties of arbitrary reinforcement. The school-yard bully who says, "Say Uncle," and twists a child's arm behind his back until the child cries "Uncle" provides a simple example of a mand. The performance that is generated has an arbitrary form, specified narrowly by the speaker, and the benefit is to the speaker rather than the listener. Skinner describes other mands in Verbal Behavior (1957, p. 35) as follows:

> In a given verbal community, certain responses are characteristically followed by certain consequences. Wait! is followed by someone's waiting and Sh-h! by

silence. Much of the verbal behavior of young children is of this sort. Candy! is characteristically followed by the receipt of candy and Out! by the opening of a door. These effects are not inevitable, but we can usually find one consequence of each response which is commoner than any other. There are nonverbal parallels. Out!, as we have seen, has the same ultimate effect as turning a knob and pushing against a door. Both forms of behavior become part of the repertoire of the organism through operant conditioning. When a response is characteristically reinforced in a given way, its likelihood of appearing in the behavior of the speaker is a function of the deprivation, associated with that reinforcement. The response Candy! will be more likely to occur after a period of candy deprivation, and least likely after candy satiation. The response Quiet! is reinforced through the reduction of an aversive condition, and we can increase the probability of its occurrence by creating such a condition--that is, by making a noise.

A degree of coercion may be present in many of these examples although it is less apparent than in the examples of the school-yard bully. The child who asks for candy will frequently vary the form of the request until it influences the listener to give candy. If the parent is not positively disposed to give the child a candy, the child whines or cries repeatedly because these have been aversive stimuli which the parent has terminated in the past by giving candy. Such a request is functionally a demand.

In the verbal tact, the immediate benefit is to the listener rather than the speaker, so that the speaker does not determine or coerce the exact form of the listener's performance. The verbal performance, "The ice cream man is here" will allow a listener to buy ice cream if he is disposed to do so. Whether the speaker will influence the listener's conduct, in such a situation will depend more on the listener's inclination to eat than the speaker's wish for him to do so. The same verbal topography could, of course, also be a mand if the speaker were a child's mother at the dinner table who was in fact inclined to make the child eat by applying aversive stimuli if he did not.

The most useful kinds of therapeutic verbal interactions with children emphasize the kind of verbal conduct exemplified by the tact (natural) rather than the mand (arbitrary). When an adult commands a child, "Come here," "Get off the chair," "Bring me the puzzle," "put the blocks in a row," the child's performance if it occurs at all, frequently depends on some kind of coercion or use of aversive stimuli which have been applied in the past when the child has not conformed. When a statement to a child is not coercive or arbitrary, it is effective because it serves as a cue for the child's existing repertoire. Thus Jeanne Simons who was helping a child draw a picture, was not commanding when she said, "Give me the red crayon" because the child needed the crayon for the picture. Jeanne Simons's role in the episode was the collateral support she provided which made it possible for the child to complete its picture. When the child reached for the blue crayon, Jeanne Simons covered it with her hand and repeated, "Give me the red crayon." If the child were disposed to take advice about what color to choose, the experience would be a step toward understanding spoken English and an increment in the relationship betwee Miss Simons and the child. The performance of shifting to the red crayon is reinforced by the role it plays in the subsequent picture that emerges with Jeanne Simons's help. In this case the verbal advice simply interacts with the child's existing inclinations and the control is natural. The test as to whether the statement was a tact or mand, advice or command, comes if the child persists in reaching for the blue crayon. If Jeanne Simons insisted on the red crayon despite the child's inclination to take the blue one in order to teach the child the names of colors, then the verbal statement would be a command rather than an instruction. The interpersonal control is arbitrary and coercive if the reinforcer ultimately maintaining both the child's and therapist's behavior comes from the therapist's inclination to teach the child the names of colors. In the natural case, getting a crayon will lead to drawing a picture if the child is inclined to draw pictures. In the latter case, getting the child to take a crayon may lead to a struggle between child and therapist and a temporary increment in the child's repertoire which will disappear when the child is no longer under the control of the therapist.

Something of the distinction between a tact and a mand is seen in the dangers of giving advice in interpersonal therapy with a paranoid patient. The observation was made that the patient became depressed when she was angry. The patient readily incorporated the suggestion because of the current positive transference with the patient. Behaviorally it could be said that the reinforcer monitoring the patient's statement when she (correctly) identified her depression as being caused by being angry at someone. Clinically, however, the difficulty was that the patient's ability to observe her depressions and their antecedents was so narrowly under the control of the therapist's reaction, was that the repertoire was lost when the relationship to the therapist entered into a stage of negative transference. If the patient had discovered this relationship without prompting (if the reinforcer was the use of the observation to improve the patient's conduct) then this productive kind of observation would have remained despite the changes in the relationship with the therapist.

Arbitrary and Natural Reinforcement in the Training Program for the Therapist

The same relation that was described between the verbal behavior of the Linwood staff and the children held for the verbal interaction between the project leaders and the Linwood therapists and counselors. As with all the other interactions which have been analyzed in this chapter, the wishes of the instructor and advice or information given to the students are not sufficient conditions to influence them successfully. The situation is an extremely difficult one to analyze behaviorally because there are two systems of reinforcers, which may be analyzed separately but which interact with each other. The first system, is the moment to moment behavior of the instructor, as it is reinforced by its influence on the members of the group. The student's behavior reinforced by the reaction of the instructor and the student's behavior reinforced by its influence on other students. This is the kind of interaction usually referred to as the group process. The elements of this interaction involve primarily the adult participants. The children in the treatment center are relevant only to the extent that they have influenced the conduct of the various individuals in the group and give them something to talk about. Over a longer time span, however, the outcome of the therapeutic activities with children is the event which needs to control both instructor and therapist. An ideal situation in which all of the performances of all of the individuals are reinforced naturally so that the student's repertoire will persist after instruction is ended is described in the diagram below.

Instructor	P^{verbal} Advice or instruction ↓	→	S^D Change in child's or staff member's performance ↕
Therapist	S^D Advice or instruction	P → Therapy activity with a child	S^D Change in a child's or staff member's performance

The instructor's motives are described by the top part of the diagram by the performance "giving instruction" and the reinforcer maintaining it "the student's therapeutic effectiveness with the children."

In practice the instructor can extrapolate from the way the student behaves in the group to what he is likely to do in his own work with children. The student, for example, who learns to record, observe and interact with the actual conduct of the group as well as describe and analyze accounts of children's behavior, has acquired some of the means to do similar things with children. The instructor can pick up clues from how the student-therapist deal with the conduct of the group which can predict his performances with children. Thus, only if the student is disposed to improve therapeutic technique and to learn how to observe the children more accurately will the interaction be stable. In that case, the same reinforcer maintains the performances of both the student and instructor and they have a common motive. Any advice provided by the instructor which makes such improvement possible will change the behavior of the therapist which will in turn maintain the instructor's performance. The student's behavior, in the bottom line, is maintained by the change in his therapeutic effectiveness with children. In the shorter term, however, the actual reinforcers are the arbitrary social control by the instructor and the group process.

The arbitrary case, diagrammed below, shares most of the characteristics of the other cases of arbitrary reinforcement which have already been described.

Chapter 3

ARBITRARY REINFORCEMENT

$$\begin{tikzcd}
\text{Instructor} & P^{\text{verbal}} \arrow[r] \arrow[d, "\text{Advice or instruction}"] & S^{D} & P \arrow[d, "\text{``Good job'' or ``Well done''}"] \\
\text{Student} & S^{\text{aversive}} \arrow[r] & P_{\text{Therapy}} \arrow[r] \arrow[u] & S^{\text{aversive}}
\end{tikzcd}$$

If one were to actually view the performances described by the diagram they would not look very different from naturally reinforced behavior. The differences come from the reinforcers maintaining each performance (the motive) and their persistence in a broader environment. The instructor's performance, in the arbitrary case, is still reinforced by the changes in the behavior of the student. The student's performance, however, is reinforced by the approval of the instructor, rather than the change in a child's conduct or an increment in his ability to describe behavior in the group. The instructor's advice is indicated as an aversive stimulus because the student may incur the instructor's displeasure if he doesn't follow it. In that case the student's performance avoids the instructor's disapproval. If the instruction were purely advisory, as with the natural reinforcement example, it would not be necessary to praise the student who dealt successfully with a child and there would be no basis for aversive control (negative reinforcement). The interaction is arbitrary also because the student's behavior is reinforced by the instructor rather than the child. The student whose activities are reinforced by the child's behavior will be only the beginning to learn when his instruction is ended because the changes in the child's conduct will continue to shape and refine his therapy. The student whose behavior comes from the instructor's reaction will achieve a repertoire dependent on continued instruction and supervision and less adaptable to moment-to-moment interactions with the child. Finally, a student under the direct control of the improvement of the child's behavior brings the unique features of his own experience to the therapy situation. He can surpass his instructor's skill rather than achieve a pale imitation.

An incident described by John Holt, comparing a child's performance reinforced by its direct achievement and one that requires the attention or praise of a teacher, further illustrates the same distinction. He contrasts the extreme persistence of a pre-school child who does not quite succeed in assembling a mechanical pen with a child in school later in his life who experiences distress at slight failures. The child's persistence and emotional attitude changes because the motive becomes the praise or censure of teacher or competition with other children in the class rather than intrinsic reward from completing the task (Holt, 1967).

The paradigm of natural reinforcement suggests, with most clinical procedures, that primary consideration be given to the motives of students rather than the instructor. If the instructor does anything other than react to the student's performances, he suffers all of the disadvantages of arbitrary reinforcement.

To react to the student's performance, however, the instructor needs to identify the reinforcer maintaining them. The problem is that statements that the student might make are functionally different from their apparent meaning. To understand the verbal performance we need to know the variables which have generated it. When a child says "cooky" we may not know whether he is asking for a cooky or identifying the object he sees across the table. A functional analysis of the performance needs to be carried out in order to make the distinction. Unless the therapist knows what reinforcers have maintained a verbal performance, he will not know a relevant reply. Ginott's example of a child complaining to his parents of a bad day at school, illustrates the separate functional aspects of a statement which must be understood before there can be a meaningful reaction to it (Ginott, 1967). The parent who says, "You must have felt awful when the teacher criticized you" rather than "What did you do wrong?" is reacting to one of two possible antecedent conditions of the child's statements. The verbal performance came both from the form of the incident at school and the child's discomfort, but its emission in the presence of the parent was motivated by the child's discomfort rather than a problem for which a solution was being sought. In such a case, telling the solution would be humiliating as well as non-responsive to the original statement. Dealing with the discomfort of the therapist also could have an important instructional purpose. For example, an opportunity to describe the circumstances surrounding the therapist's discomfort, might help the therapist because of an increased ability to observe his own conduct. The inquiry into the circumstances of a therapist's discomfort may prompt other persons to think about similar occurrences in their work and the descriptions could provide a useful exercise for all concerned to learn how to observe their own behavior and to use behavior language.

A therapist on the verge of a solution to a problem, to mention another example, may bring up a problem to solicit minor prompts from the group because he was on the verge of a solution. To tell this person the solution would be to preempt his achievement of the solution on his own. A particular student who already had the solution to a problem, might raise it as an oblique way to demonstrate it to the group without appearing to show off.

In all of these situations, the instructor reacts to what the students have said rather than lectures to them. He instructs them in the sense of giving them directions for achieving their goals. To be able to prompt, instruct and provide models, the instructor needs to be able to see the details of the student's current concerns and competences.

Complex processes such as the student's identification with the instructors are further examples of conduct only possible with natural reinforcement. To put the processes of identification in the context of arbitrary and natural reinforcement, it is helpful to refer back to the details of the conduct described by the term. The instructor can carry out performances whose outcome is useful toward some reward activity or accomplishment. The same outcome, if the student could achieve it, would make possible similarly rewarding experiences for the student. The student therefore will engage in activities which will lead to the same repertoire as the instructor. The frequently quoted example of the child dressing up in her mother's clothes illustrates the process even more simply, even though the child in adult clothes is not really able to achieve all of the outcomes that adults can. The reinforcing effect of the adult clothes is an induction from the parent as a person who makes possible so many events important tothe child. In the classroom the process of identification depends critically on existing motive in the students which is the basis for the identification with the instructor. It would not be possible for the students to identify with the instructor if they did not have experiences with children which suggests possible rewarding achievements similar to those the instructor is discussing. The natural aspects of the behavioral control arise because the instructor does not actually reinforce new behavior in the group or create a new repertoire. Rather he interacts with the existing repertoire of the individuals in the group and produces a small rearrangement and requirements that allow the students to go ahead a little more effectively than before.

Chapter 3

ARBITRARY AND NATURAL REINFORCEMENT IN THERAPY

The Goals of Therapy

Most of the traditional goals of psychotherapy emphasize the connotations of natural reinforcement. When some clinicians object to the extensions of animal principles to a therapeutic setting they are implicitly reacting to the disadvantageous feature of arbitrary reinforcement.

The main issue, that of defining the goals of therapy, is the same one that Rogers raises in his debate with behaviorists when he opposes the control of behavior and favors self-realization by the client (Rogers, 1951; Rogers and Skinner, 1956). The goal of therapy is partly concerned with deciding whose motive shall determine the direction of development of the patient's repertoire. Rogers expresses it,

> That the individual has a sufficient capacity to deal constructively with all those aspects of his life which can potentially come into conscious awareness. This means the creation of an interpersonal situation in which material may come into the client's awareness and a meaningful demonstration of accounts shows exceptions of the client as a person who is competent to direct himself.

In his debate with Skinner, Rogers (1956) expresses the goals of therapy in the context of questions about the control of behavior and who is to exert it.

> The conditions we have chosen to establish, predict such behavioral consequences as these: that the client will become self-directing, less rigid, more open to the evidence of his senses, better organized and integrated, more similar to the ideal which he has chosen for himself. In other words, we have established by external control by the individual, in pursuit of internally chosen goals.

The goals of therapy that Rogers sets, like natural reinforcement, emphasize the client's goals and modes of conduct. Rogers's statement about internally chosen goals has most of the connotations of natural reinforcement. It implies that the primary events the therapist deals with are the client's own observations of his life. Implicit in Rogers's statement is that any way that the therapist can enable the client to observe his own behavior and its relation to the environment will allow the client to develop conduct to achieve goals which can sustain him.

Psychoanalytic treatment has much the same attitude as Rogerian therapy when the analyst recognizes the stage of personality development of the patient and reacts to what the patient says at this level. The basic injunction of psychoanalysis, "say whatever comes to mind," also expresses the patient's control of the basic content of the therapy in a way very similar to Carl Rogers's practices. So long as the analyst reacts to the patient's current repertoire, and the current environment including the analyst himself, there is no possibility of arbitrary control. For this reason, it is frequently considered appropriate to deal with a very limited problem even though the analyst suspects that the incident is symptomatic of many other areas of the patient's life. Dr. John L. Cameron described a patient who began treatment for acute discomfort in airplanes, despite his conviction that he would discover more general problems of which the phobia was a symptom.

It would be possible to broaden the scope of the patient's therapy if in the course of talking about the airplane phobia, the patient began to observe other areas of difficulty in his life which bothered him enough to seek help. The definition of the patient's problem is paced with the kind of discomfort that the patient has experienced and is willing or able to admit. The natural reinforcer (negative) that Dr. Cameron is waiting for before he extends the area of the therapy, is the discomfort that the patient can observe in other areas of his life.

Glover (1955) refers to the dangers of arbitrary control of the patient's behavior in psychoanalysis when he writes:

> Now the possibility of technical miscarriages cannot be neglected. It would be folly to pretend that the analyst is not as prone to make mistakes as any other practitioner. He is indeed much more vulnerable in this respect: for although many mistakes of detail can be rectified during the course of an analysis, there are occasions when an analysis may be hopelessly

> prejudiced in the first few weeks by adopting attitudes and policies which run counter to the patient's settled prejudices or effective codes.

Searles (1965) conversely refers to the advantages of natural reinforcement when he writes:

> When the therapist conveys to the patient such a freedom to choose, he fosters by the same act an atmosphere in which the patient becomes exposed to a mounting inner necessity to choose, a mounting realization of the necessity to commit himself to either an autistic-symbiotic mode of existence on the one hand, or on the other, to genuine object-relatedness-to existence as a separate individual among individual other persons.

"The freedom to choose" seems to refer to "emitted operant behavior" from the patient's existing repertoire. By increasing the frequency of these performances, the patient's repertoire, is augmented. A high frequency of emitted behaviors is a necessary condition before the patient's behavior comes under the control of environments external to him (object relatedness).

Jeanne Simons expresses the notion of self-direction by the patient as follows (Ferster, 1967):

> And that's why we walk behind the child. He feels your protection when you walk behind. If you give him a chance to go any direction, he may be wrong when he goes this way or that. Just follow him. If it's a dead end, pick him up gently and bring him to a main route. But never think that you know the answer, because you are dealing with an individual who may want to go very different routes which for him may be better. That's why I feel more comfortable behind the children so I can see where they are going.

This statement, about the goal of therapy, implies collateral support of the child's repertoire by the therapist which anticipates difficulties the child may encounter and encourages the most effective parts of the child's current capability (looking for health in the child, she might say).

The "individual who may want to go different routes" suggests Rogers's phrase, "internally chosen goals" or "natural reinforcers." Staying behind the child has the same connotations as the general principal of operant reinforcement which emphasizes that it is necessary for a performance to occur before it can be reinforced. This is opposite to the situations where therapists demand specific performances from a child. Such coercion of behavior from a child is more reminiscent, theoretically, of reflex and instinctive behavior than operant performances. In a reflex the form of the response, such as salivation, vaso-constriction, knee-jerk, or contraction of the spleen, is invariable and is evoked, in a one-to-one relation, by the prior eliciting stimulus. Following the child has the implication that the performances which the therapist reacts to (reinforces or increases in frequency) are those which she observes to be already occurring in sufficient frequency to be a current, integral part of the child's life. Only by carefully observing the child to determine exactly what his repertoire is, including the reinforcers maintaining the performance, is it possible to enlarge the child's contact with an environment capable of continued maintenance behavior. The suggestion of operant behavior as emitted, rather than evoked or elicited as a reflex response, is critical to understanding the clinical significance of the basic principles of operant reinforcement.

In summary, many kinds of psychotherapy focus on the patient's current and existing repertoire as the basis upon which all further development will emerge. They have in common, also, principles of operant reinforcement: a change in the frequency of some performance because it is followed by particular consequences. Examples of positive reinforcement begin with those performances which the individual already is engaging in. Successive approximations toward more complex repertoires are a further elaboration of the current repertoire.

The Difference Between Arbitrary and Natural Reinforcement Depends on Whose Motive is Primary--Patient or Therapist, Subject or Experimenter

Whether interpersonal control in therapy is arbitrary or natural depends on whose motive determines the successive performance as the patient's repertoire changes in successive approximations from the current, primitive ways of dealing with the environment toward more complex, structured ways which make effective contact with the social and human world. In the case of arbitrary reinforcement, the therapist arbitrarily constructs a series of steps, still beginning with the child's initial repertoire, but leading to a pre-arranged terminal goal. Any reinforcers are applied which will accomplish the pre-determined goals set by the therapist. In the case where reinforcement is natural, the therapist makes no specific decision in advance as to the exact kind of behavior he wishes to develop and the particular reinforcer which will support it. He is prepared to accept any one of a great variety of modes of conduct which he defines rather generally as performance which can bring the individual into effective contact with those parts of the social and physical environment which he thinks are important. Their impact of these performances are useful in the patient's life is the ultimate validation of their usefulness. The ultimate success of the therapist is to train the patient to be able to observe his life accurately enough to evaluate his own repertoire and change it when necessary.

By beginning with those modes of conduct already in the child's repertoire, and those aspects of the child's current environment which are reinforcers effectively maintaining it, it is possible to preserve the child's individuality as he enlarges his capability. The child's individuality is preserved in the sense that therapeutic environment preserves the unique contribution of the child's current repertoire by always attempting to enlarge the child's capability by bringing him into more effective contact with parts of the environment that already support some part of his conduct. By beginning with the child's current environment we can avoid decision about his life which are arbitrary because they are relevant to the therapist's motives rather than extensions of the child's own life style. The issue is not that the therapist does not have value judgments about whether one kind of performance is more desirable than another, but that the child's current repertoire is the context from which the therapist's judgments are made. We cause an apple to fall from the tree by shaking it by the trunk, by throwing an object into the branches, by climbing the tree, or by using a long pole. All of these modes of conduct will produce the apple. Which one is best for a particular individual will depend upon collateral factors in the circumstances surrounding the individual at the moment.

An Example of a Therapeutic Episode Focused on the Child's Immediately Preceding Conduct

Decisions about how to alter the child's environment and change one's reactivity to him is usually based on the immediately preceding behavior that the child shows. It is for this reason, for example, that a therapist such as Jeanne Simons will frequently observe a child when he just comes to the treatment center without imposing very much structure in his environment. The child's own reactivities provide clues which tell the therapist how to begin a relationship with the child. Most natural reinforcers are discovered and applied at the moment the therapist is interacting with the child. One boy, for example, who had been at Linwood for a month or so had not formed any substantial relationship with Jeanne Simons and was simply allowed to wander around the room without too much social interaction or applied structure. One day when Jeanne Simons was singing, jumping and otherwise playing with several children in the room in which Jackie was present, he began to disrupt the play. She asked one of the staff members to take Jackie to another room where he could be without disturbing the activities here. As the staff member took Jackie's hand to lead him out of the room, Jeanne Simons noticed that the boy held back, showing by his retarded step, his backward pressure on the counselor's arm, and his glances toward the place where she was playing with the children, that he was reluctant to leave. She very quickly called to the assistant saying, "Never mind, let him stay," and played with him, briefly, much as with the children Jackie had just been watching. Then she moved over to a puzzle, stood behind him with her arms around him, put one piece in his hand and held his hand over the appropriate place until he dropped it. The puzzle was of the simplest form so that a slight nudge on his part jarred it into place. When he fit the puzzle into its exact place, Jeanne Simons said instantly, "That's fine Jackie" and led him to an open area where she played with him, but only for about a minute. Then they went back to the puzzle. This time he not only dropped it into the right place but nudged it into place without Jeanne Simons's guiding his hand during the final maneuver. She acknowledged his success immediately and played with him again for another minute. The kind of play they did also emerged and developed as they gained experience with each other and reacted to each other's performances. In each of perhaps ten successive experiences (a total of about 10 or 15 minutes) she required a little more of the boy each time, until finally he picked up a piece, put it into place, walked to where she had been taking him for play and lay on the floor with his hands up wanting Jeanne Simons to play with him.

While there was no natural relation, in a larger community, between playing and putting puzzles together, Jeanne Simons, because of her knowledge of the Linwood staff and their inclination to work with and react to puzzles, knew that the social climate at Linwood could support this kind of relationship for a long time. Further, the rate at which Jackie progressed from puzzles of increasing difficulty indicated that the activity itself with the puzzles was maintaining his performances in addition to the supplementary support it received from the rough-housing and singing which followed each successful completion of a puzzle. Before very long two somewhat independent repertoires could be observed: putting pieces of a puzzle in place reinforced by the appearance of the completed puzzle and playing with Jeanne Simons reinforced by the personal reactivity it produced. In their separate form both reinforcers were natural.

When is Social Control Arbitrary

Although coercive techniques with noxious stimuli and the use of reinforcers such as food are the most obvious sources of arbitrary control social reinforcement is equally susceptible to arbitrary adjustment. Social control is arbitrary when the listener (controller) can adjust his reactivity specifically to the behavior he requires from the listener (controllee). The interaction is natural when the repertoires of both persons are imbedded in a larger social structure, which allows diversity of control.

Praise, superficially a positive mode of interpersonal control, may become arbitrary, coercive, and manipulative if it substitutes for the natural consequences of the performance. A skilled carpenter knows when he has built a fine piece of furniture and the reinforcer that will maintain his skills most productively will be the money he earns, the knowledge of the use the furniture is put to, and the subsequent business his send to him. To the extent that a craftsman is dependent on praise of his work, he has shifted the control of his behavior from a stable outcome to the reactivity of another person who may deliver or withhold praise for his own purposes. The child who works in school "for his teacher" may lose his behavior when he goes to another classroom with a teacher he is not disposed to work for. A child who has had the experience of educational achievement which has led to new experiences inside and outside of school has a repertoire which will persist. The latter kind of child is called "inner-directed" despite the fact that his motivation comes from the many ways his repertoire taps different aspects of his culture.

A therapeutic intervention inevitably has many arbitrary features. The psychoanalyst asks (perhaps even requires) the patient to say anything that comes to mind. Rogers sets certain attitudinal conditions which are expressed to the client by concrete practices (Truax, 1966) and Jeanne Simons, particularly in her initial contacts with a child, will apply almost any kind of personal reactivity that will make contact (increase the frequency of) some item in the child's repertoire. In the example previously given of the child on the rocking horse, the rhythmical singing was an arbitrary consequence of rocking as was the roughhousing and playing with Jackie that followed each time he completed a puzzle. The therapeutic environment provides a sheltered context, which at least for a short time, can continue to support behaviors which are arbitrary elsewhere. In the formal context of a therapeutic children's group, for example, it is likely to be sustained because the reactivity of the therapeutic environment is likely to stable with one individual from time to time and from individual to individual.

The danger of such arbitrary aspects of this kind of control is that it may reinforce the child's existing repertoire without the successive approximation toward complex forms that occur naturally in the growth and development of child in the normal parental environment. It would be very difficult to specify a procedure for carrying out the gradual increase in the complexity of the child's behavior that the community requires. In the normal environment, forms of conduct which more clearly approximate community practice have a higher probability of reinforcement than a less adequate form. The community still accepts the less adequate form, at least until the child has acquired a new level of competence and the result is a steady almost imperceptible increase in the child's capability. A successful therapeutic milieu must approximate the gentle reactiveness toward structured behavior of the ideal parental environment.

Interpersonal therapy illustrates another aspect of arbitrary reinforcement in social control. In most situations where therapy is carried out by the interactions of two people, the personal reactivity of the therapist is the reinforcer that changes the frequency of the patient's performances. Conversely, the patient's performances might be described as those which influence the therapist. The specific form of these performances depends upon both the life style which the patient brings to the therapeutic situation as well as the normal reactivity of the therapist to such aspects of the patient's repertoire as humor, feelings of frustration, intellectual appreciation, displeasure or annoyance. If the patient is to acquire behaviors which are relevant to people other than the therapist, it is necessary that the therapist limit his reactivity to those areas where the performances which are not idiosyncratic to himself. To phrase the therapist's role more positively, he is especially reactive to those of the patient's modes of conduct which allow him to observe and manipulate his own life successfully. An interaction with the therapist is useful to the extent that dealing with the therapist is like dealing with other people. Probably the least arbitrary, and most useful, feature of the therapist's reactivity to the patient is his skill at observing behavior and relating it functionally to items in the patient's own repertoire and daily milieu. In teaching the patient to observe his own repertoire, as it is exhibited to the therapist, he acquires a skill in observation which will allow him to observe his own and other person's conduct elsewhere.

THE THERAPEUTIC USE OF AVERSIVE CONTROL

It has been clear for some time that many of the ills of human behavior have come from aversive control. Behavioral scientists have studied it in the laboratory in the hope that a technical knowledge of the processes would teach how to ameliorate psychopathology. Psychologists, particularly under Skinner's (1948) influence, have speculated about a society without any aversive control. Some psychologists, experimental and otherwise, have felt so strongly about aversive control that they raised their children as much as possible by positive reinforcement alone. Much of the impact of experimental psychology on education has been in the direction of encourage a shift from aversive to positive control over the student's conduct (Skinner, 1968). The reasons for the large emphasis on positive reinforcement rather than aversive control are partly moral and partly technical. Part of the moral problems with aversive control come from its connotations of reject, avoid, escape, and withdraw. Most people's feelings about aversive control are that "It's better to give than to receive," which suggests something of the moral dilemma. Aversive control is obviously used widely in the normal environment because it achieves something. The reasons for its use are not hard to find. First, it changes behavior immediately. Second, if it is made severe enough, the behavior it controls will override any other performance the person might engage in. Third, the aversive stimulus itself is the motive for the behavior that is required. It is not necessary to take into account the disposition of the person who is controlled (Skinner, 1953). On the other hand, despite their immediate control aversive stimuli make us uneasy because they produce by—products such as anxiety and other general disruptions of the operant repertoire (Skinner, 1966). Aversive control leads to avoidance of the controller and general aggressiveness. Furthermore, it substitutes avoidance and escape for productive behavior. The problems that come from aversive control are not so much the behaviors that the controller intends to produce as the behaviors that occur unintentionally. The same aversive stimulus produces both.

A further problem with aversive control is that it is a primitive mode of conduct. Ginott (1967) describes the example of a child hitting another child out of annoyance and the parent shouting, "How many times have I told you not to hit, what do you mean hitting, don't you know that hitting is wrong?" as he struck the child repeatedly on the face and body. Such use of aversive control is an example of the Freudian "primary process" in the sense that it is a simple primitive-like behavior reinforced by its immediate consequences. It frequently occurs because of an inability to defer action or substitute a more complex reaction extended over a longer period of time. Most techniques of positive control require some constraint, such as frequently waiting and reinforcing some incompatible behavior, or ignoring the behavior over a period of time. Most social positive reinforcers require the development of considerable interpersonal behavior before they are effective. The interpersonal behavior in turn depends on many other component performances. Before the attention of an adult becomes a reinforcer, for example, the child needs to be disposed to act on many different features of the non—social environment which the attention of the adult makes possible (Ferster, 1961; 1966; see Chapter 1).

Despite the general disfavor with which the technical literature in experimental psychology has viewed the use of aversive stimuli to control behavior, many investigators are turning to it for therapeutic use. More recently, mostly as a result of the urgency of controlling self-destructive behavior in autistic children and because of the technical difficulties in controlling these children with positive reinforcement, the cycle has gone a full turn. Investigators, such as Lovaas (1965), have turned to aversive control with stimuli such as intense electric shock, slapping, shouting, and incarceration in order to suppress self-destructive behavior, to reinforce attention, and to weaken tantrums. Other investigators and therapists have been using electric shock with adults in what is called aversion therapy.

The argument for the use of aversive control with children is based on the presumption that there is a lack of suitable alternative rather than a desirability of the aversive control itself. Particularly prominent is the presumption that in other modes of therapeutic intervention are effective (Rimland, 1964). The same argument has been advanced for using arbitrary positive reinforcement procedures such as giving a child all of its food as a reinforcer for productive behavior.

The argument becomes more urgent in case of self-destructive behaviors which might lead to a child's death or severe disfigurement. Such behaviors are treated in some clinical environments by using straight jackets, tying the child's hands and feet to the four corners of the bed or by large doses of tranquilizers. Lovaas has argued that severe punishment of the self-destructive behaviors is a preferable alternative to these. Its use is designed to suppress the performances temporarily until the child may develop a positive repertoire that will preempt the destructive performances. One of the difficulties in controlling self-destructive behaviors as Lovaas's research so clearly proves (Lovaas, et al., 1965) is the inadvertent social reinforcement of these performances by many people in contact with the child. Obviously the most intelligent solution to prevent the development of such persistent behavior by eliminating so much reactivity to it. Once the social reinforcement of this primitive behavior is eliminated, the problem is to find other ways to reduce the frequency of these primitive behaviors enough so that the child can learn other less damaging ways of engaging the social environment. The dangers of arbitrary control, serious enough with mild noxious stimuli and positive reinforcement, are compounded with intense shock and corporal assault. The reinforcement of the controller is instant and the dangers and complications from the personality characteristics and difficulties of the therapist are obvious.

THE USE OF REINFORCEMENT PROCEDURES TO CHANGE BEHAVIOR IS A NARROWER APPLICATION OF THEIR USE THAN TO UNDERSTAND THE COMPLEX NATURAL ENVIRONMENT

Although many of the applications of principles of operant reinforcement to clinical problems have been with behavior therapy or fairly literal extensions of animal conditioning procedures, the field of operant reinforcement is considerably broader. Principles of operant reinforcement are useful in conceptualizing, describing, and observing the behaviors and procedures in any kind of therapy. When the psychoanalyst uses a conceptual term such as "narcissistic" he is engaging in a verbal performance which is occurring as a result of his prior experience with particular kinds of patients. The term narcissistic may be thought of as a common element shared by the performances which have been observed in a variety of patients. Thus the behavioral focus of the psychoanalytic concept is the patient's conduct which leads the theoretician to use a term pointing to a particular dimension of the patient's conduct. The role of principles of operant reinforcement is to describe the behavior of the patient which led the theoretician to use the term "narcissistic" rather than to find an alternative term. In this way the language of operant reinforcement is complimentary with other theoretical approaches to the study of human behavior. Theoretical terms such as "narcissistic" or "transference" provide an opportunity to determine what particular characteristics of the patient's behavior the clinical theoretician is paying special attention to. It is these behaviors then which become the focus for direct description using principles of operant reinforcement. Thus general principles of behavior need not be identified with a particular method of therapy such as behavior therapy.

The starting point for the study of behavior using objective, natural science terms can be the events in the complex natural environment. Behavioral concepts and principles of reinforcement have been identified with conditioning, reflexes, highly stereotyped non-adjusted behaviors and generally inflexible responses to the environment. Part of the difficulty and the confusion arises from the failure to distinguish literal extensions of laboratory procedures much as in an animal experiment, and the use of reinforcement concepts and modes of description to deal with natural behaviors in the normal environment.

Control and Coercion

The terms controller and controllee have pejorative connotations historically since control has always been for the benefit of the controller. Machiavelli is often considered the archetypal controller who explicitly stated procedures for altering behavior. Moreover, Machiavelli's prescriptions usually emphasized the use of aversive stimuli in procedures designed to benefit the prince rather than the subject. However, in the broader sense that the term control is used here, it defines the functional relation between a performance and its controlling environment. Hence, the use is technical and does not specify either an aversive or a positive stimulus, or whether the result benefits the controller, the controllee, both, or neither. In the sense of a functional analysis of behavior, all behavior is controlled one way or another. In some instances, the sources of control may be so diversified that the practical manipulation of the controlling environment may not even be possible.

The distinction between arbitrary and natural reinforcement suggests that the term "control of behavior" can be profitably disentangled from the pejorative sense of coercive control. A full description of the complex natural environment requires that we understand the functional relation between our conduct and its consequences in the environment. Good or bad, this functional relation is best described as control. The full complexity, humanism or freedom of behavior need not suffer from recognition of the environment that generated it.

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CHAPTER 4

PART I

THE LINWOOD SETTING

Linwood Children's Center, established to treat psychotic children, occupies a three-story mansion built in the 1800's in Ellicott City, Maryland, northwest of Washington, D.C., near Baltimore. The most profoundly emotionally disturbed children diagnosed at the pre-school age -- those showing symptoms of Primary Autism (Kanner:Syndrome) or Childhood Schizophrenia, are the Center's particular concern. The Center was not intended for seriously brain-damaged or innately markedly retarded children. Many of the children are completely withdrawn from the world of reality, are mute, or do not attempt to communicate verbally and often fail to make the essential distinction between people and inanimate objects. Without help, most would spend their lives in institutions.

Linwood had its beginning because of Jeanne Simons, M.S.S., the present Director of the Center. Known for her pioneering in the treatment of childhood autism and schizophrenia, Jeanne Simons was the Director of group therapy at Children's House in Bethesda, Maryland, before establishing Linwood. Born in Brussels, she spent her early years in Holland where she developed her own school for maladjusted children.

Jeanne Simons's concept of a residential setting began while working as a therapist with emotionally disturbed children at Children's House. She developed a particular interest in the pre-school children who were refused admission. The prevalent attitude in most Centers at that time was, if children were sick that early, there was little that could be done about them. During this time, she also worked intensively with an autistic boy who was one of the children included in a study by Dr. Leo Kanner, in which he presented the classical description of autism in 1943. During the year that Jeanne Simons worked and lived with this boy he showed tremendous improvement in spite of his autism and brain damage. The child's progress was such that he left the Institution to live at home and was able to travel in Europe with his parents.

Jeanne Simons's concern for the pre-school aged child and her experience with the young boy combined to increase her growing conviction that if she could begin working with children much earlier, she could do much more. With Dr. Kanner's encouragement she started a day group for pre-school children. There was a great demand for the facility from the start. When the children were first admitted they appeared to be mainly withdrawn but with treatment in the day-care center they became almost like young infants -- biting, soiling, discovering their bodies; all kinds of behavior that would be expected in a very young child began to appear in place of the withdrawal and compulsive behaviors that had previously characterized them. Parents found it so difficult and disturbing to deal with these primitive behaviors that a decision was made to put these children in residence for a one-month period. Residence was tested in three successive years with great benefit to the children and their families.

The success of this short-term residential experience prompted attempts to start a treatment center where children could go into residence for longer periods of time and a search was begun for a building and space in the Baltimore-Washington area. A well-built mansion was located near Ellicott City which became Linwood's present location. One of the major appeals of the Linwood mansion was the semi-rural setting which provided space for children to roam; but this also meant commuting for staff and a degree of isolation.

The Linwood Center started with a day-care program with eleven children. These came from the local area and were transported from their homes to Linwood each day. The transportation was provided by a donated limousine, that had been used by auto-mechanics classes. The staff of the new Center consisted mostly of people who had been with Jeanne Simons at Children's House. The staff included a practical nurse who had requested the opportunity to work with Jeanne Simons at Linwood, another assistant, a high-school graduate, a social worker who served as the Director's assistant, a teacher certified in elementary education, and the maintenance man who also assumed the duties of sometimes cook and bus driver. Dr. Rice was the part-time Medical Director of the newly-formed center.

The Center began operation with plans and procedures evolving on a day-to-day procedure; there was no time to consider tomorrow. Jeanne Simons said, "Everything had to be done right there and whatever would happen tomorrow had to be built upon what happened today."

The resources were minimal, with little equipment and no furniture. The building itself presented challenges ranging from the coal Franklin stove to the leaky rook, the pump and well,and the frozen pipes. Supplies consisted of paper, crayons, newspapers, magazines, the kinds of materials that could be found anywhere. The staff members had to begin where the child was and make the best of it. Jeanne Simons described her approach to the program:

> "If I had had money to equip Linwood, I still wouldn't have spent it. My whole idea was to come into an empty shell with a solid roof. From there on, we would start all over without pressure of the outside world and to start where the children were and build an environment at Linwood and construct a program from what the children would show me. They all play with string, so we would start with a string. And then we bought some beads to use with the string. If a youngster twirled, we got things that would twirl. We got cardboard, and we cut out circles and connected the twirlers with the string and the circles so that the children

> could twirl that. This was an example of how you go step by step. Whatever we have in Linwood, the children have shown me. The equipment that they can benefit from. You start with the need of one child and build with that, in the long run, you have something that can be used by all the children, but begin where the children are."

The schedule was flexible, and there was no preconceived idea of what should be scheduled. The staff observed the children and based structure upon what they saw. For example, eating habits were poor and no child sat down. Meals were served cafeteria style so these children would pick up some food that they wouldn't take if it were put in front of them, and eventually they would eat.

In reflecting on the beginning of Linwood, Jeanne Simons felt the major theme was patience. She had no precise ideas of what the Center would be or even whether it would succeed. She just wanted to give some of the young children a chance to have an opportunity to observe what could be done. As the Children's Center continued to expand in terms of the number of children admitted and the staff employed, it was incorporatec in 1955 and operated by a Maryland non-profit corporation, headed by a board of directors of interested community leaders.

The Linwood Staff

When the project was introduced at Linwood, the personnel represented a range of experience and training. The administration staff, directed by Jeanne Simons, included a part-time secretary and a full-time administration assistant who also handled the Center's business affairs. A social worker, M.S.S. also worked with the Linwood Program and assisted the Director. One of her primary responsibilities involved working with parents of children admitted to the Center. The housekeeping staff had expanded since the establishment of Linwood, increasing to four housemothers whose responsibilities involved caring for the building and cooking, a maintenance man, and a bus driver and repair man. A practical nurse was available both day and night, and a couple trained in Japan lived at Linwood and worked with residential children as well as the day-care program.

Although all the people who worked at Linwood had contact with the children, the staff members working in the children's rooms during the daily program had primary responsibility. Two of these staff members, one who had come from Children's House with Jeanne Simons, were high school graduates and had been involved in working with children for a number of years. The teacher in charge of the schoolroom was an experienced teacher with elementary education training. The other staff person, an experienced therapist and teacher worked primarily with the younger children.

During the summers counselors were also a part of the Linwood staff. These temporary staff members were primarily students, interested in education, psychology, and working with children.

A psychologist served on a part-time basis, observing children and working in individual therapy with some of the older children. Dr. Kathryn Schultz, a child psychiatrist in the Baltimore area, Medical Director of the Center, worked closely with Jeanne Simons. Perhaps one of Dr. Schultz's contributions to Linwood was the encouragement she provided for Jeanne Simons's inclination to analyze her methods of therapy with the children. According to Jeanne Simons, Dr. Schultz had been the first person able to effectively discuss with her the particular intuitive actions of the "Linwood Method."

Training of Staff

The style of training staff at the Center was primarily focused on the outgrowth of their observations and interactions with the children. The position was basically to allow a period of time for a new staff member to consider various approaches. During this initial time, they would learn a natural mode of reactivity with the children. After they had had some rapport with the children and some techniques for dealing with them some attempts were made to structure their experience.

There was little emphasis on records. It was felt this policy might avoid categorizing and prognostication about children which would disrupt objective observation of a child's current behavior. Staff sessions were scheduled weekly for a discussion of specific questions and concerns of staff members.

Jeanne Simons, retrospectively commenting on her earlier training procedures said that she felt that staff members most able to benefit from training were those already possessing "intuition" or skills in diagnosis and analysis of behavior.

> "In my teaching experience before the Linwood Project, a student could pick up my approach and techniques if he were intelligent and intuitive. This was difficult and not too efficient learning. I can't yet fully explain intuition--although people have often told me I had exceptional intuition. Intuition can only be used to greatest advantage when used with intelligence. When I have been pushed for more explanation of intuition, my only statement had been that intuition is an accumulation of observations--what kinds of accumulation was not known. But this was not a very fine-grain description."

Admission to Linwood

During any period of time, there were about thirty children at the Center. They come primarily from counties of Maryland, Virginia, and the District of Columbia. The age range included pre-schoolers of three years and up to early adolescence. When first admitted to Linwood, the children generally were between three and six years of age. Most remained at the Center three to five years, during which time they were in residence for varying durations.

Children were usually referred to Linwood by private physicians and Diagnostic Centers who recommended residential treatment. By the time they had contact with the Center, most had already sought help from many sources and had extensive and often conflicting diagnoses.

A pre-admission evaluation determined whether a child was suitable for the Linwood environment. As part of this evaluation both parent and child visited the Center. This visit permitted the Director and the Medical Director to observe the child's behavior in the setting of an equipped room and the behavior of the child with his parents. This session also provided an opportunity for the social worker to confer with the parents.

When a child had been accepted by Linwood, his first days were paced very gradually. For a period of time he might attend for half-day, one-hour a day, or three times a week, until it was felt the child was familiar enough with the Linwood environment. The transition to the Linwood environment is carried out very slowly so as not to suddenly cut the child off from his familiar surroundings -- the bed or crib, the color of the room, or something they are compulsive about.

Minimal demands and limits were placed upon the new children giving them opportunity to explore the strange setting, separate more comfortably from parents and to observe activities. If a new child, for example, was disturbed about eating in the dining room, he was served in the hall or a children's room. This relative freedom also gave staff a chance to observe the behavior of the child and to discover where he was. The staff might begin work with the child after the child had been at the Center long enough to be comfortable using the behavior they had observed.

Day Care and Residential Treatment

Even though most children come to Linwood with a recommendation that they be in residence, they all begin in the day-care program for a period of time. Thereafter, residence or day care is determined by the particular needs of the child and the family. The transition to residential treatment is designed to avoid an abrupt break with the familiar home environment. Past experience showed that a sudden change disrupted the Linwood children markedly. The first time the child sleeps over at Linwood occurs after he has been there for a while and has had an opportunity to look over the various parts of the building and to discover the dormitory area. If the child is not upset by several overnight periods at Linwood during which he is a "visitor" then he would move into residence for a longer,more continuous period. The decision as to whether a child should be in residence was frequently based on the family situation at home. Sometimes it was necessary to give the family a rest from the very difficult child. Sometimes a child acquires infantile modes of conduct as he starts to improve therapeutically. A child who has been passive and relatively inactive may start to engage the family environment in very different ways, such as soiling, chewing on things, throwing and smearing food. Such behaviors are better handled at Linwood than at home. These behaviors would disrupt the entire household to the detriment of the child himself if the family is not protected from these disturbing new patterns. Other children control and distort the family environment so drastically that the entire household becomes geared to the child's compulsions. Once parents have re-established a fairly normal way of life, with doors open, locks off cabinets, the child can start to return home for short periods. With brief visits from the child, it becomes much more realistic for the parents to set limits for the child. In some cases the parents' tolerance is so low that visits need to be as brief as a half day or a few hours. Some children needed to be kept at Linwood over the week-end to give the family a chance to function as a unit. Otherwise the child preempted the entire attention of one of the parents. Such a child would go home during the week when the parents have increased ability to handle difficult situations because they have had some time alone or with the rest of the family.

Parental Involvement

One of the main reasons why the Linwood children were admitted from the Washington-Baltimore area was to make possible the involvement of the parents and to prevent "dumping" the children on Linwood. Ideally the development of the child needs to be paced and coordinated with the parental development so that the two can support each other. Parents are required to attend periodic group meetings and individual conferences. Even when a child is in full-time residence he usually went home on week-ends. The child would remain continuously at Linwood only under unusual circumstances such as to allow the family to take an extended vacation. In general, the relative amount of time that a child spent at Linwood or at home depended upon the particular needs of the family and the child at that time.

One of the major reasons for a gradual transition to residence and interpolated residential periods at home was to maintain the parent's involvement with the child. If the child were admitted immediately into full-time residence it would add to the impression that parents get from so many sources that they had failed as parents. Sometimes the child's sudden entrance into residence produces a severe depression in the parents. Furthermore, any progress which the child made during the initial period of residence would be attributed wholly to the Linwood therapeutic environment and as a result would therefore contribute even further to the parents' lack of involvement in the child. On the other hand, if the child begins to make progress while he is in day care, there is a high probability that the parents and the parental environment can at least take advantage of, and consolidate the progress the child has made at Linwood. This is especially true when difficult problems are solved at Linwood to make possible improved conduct at home.

The Linwood Program

The division of the children into separate rooms and groups was based mainly upon age. One group contained pre-schoolers, two other groups contained middle-aged children, and the older children were in the classroom. The composition of the groups was not rigid, however, and children were allowed to visit other rooms and take part in occasional special activities. The general plan of the Linwood environment was for a child to advance from room to room as he matured and was prepared for a more structured experience. Along with the greater structure of the upper-division rooms were greater privileges and opportunities for varied activities. Thus, while each room was designed to provide an environment adjusted to the lèvel of each child, the limitations on the child's activities and the opportunities available for the older children provided a source of motivation for the child's growth and development. Suggestive of this latent reactivity of the environment toward growth and development is the child who is told that he would be able to ride in the car to the drug store when he learned to go to the bathroom before the trip rather than soiling the car. While there was no great pressure on a child from incontinence in the lower age rooms, such a child would also be missing many of the privileges in the upper groups.

Equipment in the children's rooms was largely kept in cabinets and the number of toys and educational objects that the children were exposed to was minimized to reduce the amount of uncontrolled stimulation. New materials such as toys, paper, puzzles, crayons, were introduced as the staff members observed their relevance to a particular child's current mode of conduct. If, for example, a particular child was observed to have a large tendency to spin a particular object a wider range of materials was introduced which the child could spin and from which the therapist might broaden the child's involvement in the structured environment. The organizational and physical structure of Linwood was arranged to allow frequent and informal interactions between the children and the staff, including the Director. The result was a high frequency of unexpected and informal interactions with the children which allowed the staff to know them individually. Many conferences and meetings with visitors were very frequentally held in one of the large rooms where the program for the youngest children at Linwood was carried out (the Board Room). Because this room was so familiar to the children as a place where so many of their activities occurred at other times during the day, they tended to wander in and out and interrupt whatever proceedings were going on. Even when the door was closed a particular child had the option of knocking or shouting to gain entrance. In every case, the child's interaction with the visiting group or the staff meeting was taken as a therapeutic challenge to balance the child's needs with the purposes of the current meeting. An interruption by a child frequently provided a convenient example for visitors of Linwood's style of therapy. John L. Cameron describes his first visit to Linwood in June 1965 when he observed this flexible use of the meeting room.

> "On arrival at Linwood we were greeted by Miss Simons and introduced to two staff members, a social worker, and a teacher who were having lunch in the Board Room. The children wandered in and out, and at one point, soon after arrival, we had a look at the various centers of activity. The two staff members remained in the Board Room throughout the entire period we were there. They may, however, not have been on duty. Jeanne Simons worked with the children for a period, and it was interesting to note the speed with which she moved, so that although she seemed to be concentrating on one child to keep him from adopting a foetal position, she was constantly, equally stimulating the other two. The use of the environment was remarkable, and she was constantly attempting to increase the behavior repertoire. Dr. Schultz came in and soon afterwards Jeanne Simons turned the three children over to another staff member working in the front room. However, the children continued to wander in and out. There was a general discussion of various topics.
>
> "A child came in who was scheduled for tonsillectomy that afternoon. He was whining and seemed unhappy and Jeanne Simons interpreted this as evidence that he understood what was going to happen. When Jeanne Simons left, Dr. Schultz stayed for a while and talked with us. It is not the practice in Linwood to maintain any kind of records, nor apparently is any attempt made to formally clarify planning so that attempts to predict and to verify some occur mainly through memory of the staff members involved. The major system is to allow the child to impinge upon the organization so that the staff, presumably and in particular, Jeanne Simons, get to know him or her as an individual. Some examples were given to illustrate this point by Jeanne Simons before she left. 'Each child must have something about him by which he is known.' This may be, for example, that he is the one who gets to eat the lollipop, or that he is allowed to drink chocolate milk when the others drink ordinary milk.
>
> "After Jeanne Simons left there was an increase of noise in the building. When Dr. Schultz left, I realized that the Board Room door was now locked. When I asked if the children did not resent the exclusiveness of the Board Room, I received the explanation that ordinarily the children were allowed to wander in and out."

Dr. Cameron then posed some questions prompted by this informal style of child-therapist interaction.

> "1. What is this business of the child impinging on the organization? What are the characteristics of the child who does this? Is the activity or appearance of such a child positive or negative in the usual sense of the word?
>
> "2. What are the characteristics of the child who does not do this? Is he the same as the floaters who receive no attention?
>
> "3. Is there a corollation between the above groups of children (if such groups exist) and the success or failure of Linwood's treatment?"

The following note recorded some months later indicates the same use of the meeting room.

> "At about 2:50 after the conference ended and we had talked for a few minutes Jeanne Simons opened the Board Room door so that children could wander in from the program room from time to time. This is a very obvious device to enrich the child's development. Our presence was a potential reactivity that an occasional child could tap."

Therapeutic Goals

It is not expected that every child in therapy at Linwood will be able to return to the community. It is generally felt that it is better to begin with low expectations that are raised as the child makes progress than to set unrealistic goals which cannot be met. For some children there is sufficient gain from the stay at Linwood if the child can enter a long-term residence facility without needing to be tied, heavily drugged, or isolated. On the other hand, should a child make unexpected progress the result will be rewarding for both the child and the therapeutic staff. The results of expecting dramatic progress where it may not be feasible may be a severe disappointment on the part of the staff when communicated to the child in the form of disapproval of what progress he has made. The advantages of an open-minded assessment of how much can be expected of a child in therapy is that any progress he makes is a reward and there is no need to punish the child for lack of progress.

The very structure of Linwood defined its therapeutic goals. Within the Linwood community, there was a wide variety of environments from the unstructured pre-school group where very few demands are placed on the children and an attempt is made to make contact with them at the most primitive levels. At the other extreme is the schoolroom and the residence program in which the children go to school in the city in which Linwood is located. The natural reactivity of these environments and their different structural characteristics provide a succession of experiences which allows the child to develop at the maximum rate of which he is capable.

Some of the special features which have given Linwood Center a uniqueness and a pioneering quality were identified by Dr. Leo Kanner:

> "Foremost is a primary allegiance to each child as an individual rather than any rigid adherence to inflexible methodology. In other words, Linwood is basically child-centered rather than method-centered. Another thing is that children are admitted to Linwood on the basis of their need and the prospect of betterment rather than on any diagnostic or pseudodiagnostic terminology."

The Linwood method, frequently referred to as magical, was described by C. B. Ferster in terms of precise, moment-to-moment analyses:

> "Minute by minute, day by day, with enormous patience and infinite attention to the 'fine grain' of a child's behavior, she searches out the tiniest clues to desirable actions. She strengthens and enlarges these by encouraging positive consequences. Undesirable behavior is studied and discouraged by equally careful withholding of 'rewarding' consequences, in appropriate circumstances by allowing unpleasant consequences to take their natural course, or by focusing on alternative kinds of conduct. Rewarding and unpleasant consequences differ for each child. The 'right' direction is an enlarged structured repertoire expanded from the child's current capability. With much clinical skill, Miss Simons expands and 'shapes' a child's behavior to forms which enable him to increase his contact with people and the rest of his environment."

The Transition from Linwood to the Community

After a child developed sufficiently in the schoolroom so that it was time to consider his involvement in the natural community, he was enrolled in the public school near the Linwood Children's Center.

The children go into a normal classroom of 30-40 children, although at first they only go for a half day. The school principal and child decide when to increase to a full day. They have to function in all the ways other children in the class do except perhaps in social activities. At the same time parents are encouraged to make arrangements in social groups at home such as Boy Scouts, Sunday School or art classes.

Chapter 4

The local school was used instead of the one near the child's home to give the child an experience in which he could test the new environment without incurring stigma that would follow him for a long period of time. The Linwood staff in general remained uninvolved with the child's actual conduct in school and gave the teachers little information other than the fact that the child had beenin treatment in the Center. When problems arise they are evident when the child comes home upset from school. These problems are treated as with any school child. At other times the principal or school nurse calls.

By the time the child was ready to enter school in his own community, he had a chance to test out his repertoire in the school and usually to adjust sufficiently that the school experience in his new community benefited from what he had learned previously. The child's teachers also experienced less anxiety about the child when they knew that he had previously attended school successfully.

Chapter 4

PART II

THERAPEUTIC PROCEDURES

This section describes some of the actual procedures for dealing with the Linwood children. The primary data is observation of Jeanne Simons and others in actual therapy with the children. The emphasis will be on a behavioral description of the therapy procedures rather than a complete account of how to do therapy. The data are taken from notes recorded by various observers of children taking part in the various parts of the Linwood therapeutic environment. The initials following each account designate the person who observed and described the episode. These were C. B. Ferster, Helen Witkin, Mary Carol Perrott, John L. Cameron, and Charlotte Farrand.

Reinforcement and Extinction

The following notes describe elements of therapeutic interactions which illustrate simple examples of reinforcement.

> Using a Compulsion as a Reinforcer. Flint sits screwing and unscrewing the parts of the carpenter bench for hours. She occasionally pushes the carpenter's bench toward the middle of the table and places a puzzle in front of Flint. When he completes the puzzle she returns the carpenter bench. (H.W.)

This required the therapist to prevent Flint from grabbing the carpenter bench when the puzzle was in front of him. By now he completes the puzzle or whatever activity she places in front of him (reinforced by access to the carpenter's bench) and the frequency of reaching for the bench instead of the puzzle is low (extinction).

> Enlarging a Game by Using one Part as a Reinforcer for Another. As I sat in the yard watching several of the small boys playing, Phil came up and put his head in my lap. He soon discovered that it was a game to slide down my legs head first to the ground. After doing this several times, he began immediately running around to the back of the table, climbing up, and wanting more. I had noticed that he had been playing with small stones and bark pieces before this, so as he came across the table I handed him a small piece of bark about 12" behind me and then put my hand out at my side to receive the bark before allowing Phil to slide down my legs. Each time I handed him the bark farther and farther away. Soon he was receiving the bark at the side of the table, carrying it about 3' around to the back, playing with it for a moment before climbing up, and then placing it in my hands as he came across the table top. I stopped the game when Phil dropped his piece of bark and would not pick it up. (M.C.P.)

Chapter 4

Drawing; Thursday, March 4. Jeanne Simons called several children over, one at a time, to draw on paper. The drawing was different for each child. With Gus, she simply made a line and accepted any line that Gus made that was reasonably straight. Initially she gave Gus a piece of candy (a very tiny amount) for almost any mark on the paper. On successive turns she began to omit the candy. With Max who was more capable, she drew two circles, one for the head and one for the body. Max had to draw lines for the feet which completed the figure. On successive turns she asked Max, and the others, to complete more of the figure or to copy better. The third figure Max worked on needed hair. For 30 minutes five children all interacted with her, in turn, conforming their performance to that required in the situation. (C.B.F.)

Reducing the Frequency of a Reinforced Performance. Jack ran in and out of the room repeatedly. Jeanne Simons asked that he be ignored because she guessed the performance was maintained by the people who chased him. The first time that he entered without chasing or noticing him, he left quietly. When he entered the room a second time he stayed in the room for about ten or fifteen minutes, and so long as he sat quietly, played with the puzzle, or walked about unobtrusively he was virtually unnoticed. When after about ten minutes he went into the cabinet and took down a box with some cookies, Jeanne Simons intervened by capturing him, taking the cookies out of his hands and mouth and sending him out of the room. When Adrian chased him, he came back still another time. (C.B.F.)

Karen

The following episodes are continuous accounts of Jeanne Simons working therapeutically with Karen, the child on the rocking horse described in Chapter 2. The episodes are longer and somewhat more complex than the preceding examples.

February 9, 1965: Jeanne Simons began a new activity with Karen. In a series of successive approximations Karen opened interlocking colored plastic eggs which fit inside each other. She began with the performance she could observe--playing with the smaller egg. At first Jeanne Simons placed the smaller shell under the big one within the sight of the child, and Karen lifted the big one off to get the small one. Later she piled a shell on top of another and the doll on top of that, so that Karen would go through the pile starting at the top until she got the shell at the bottom. Next Jeanne Simons placed the small shell inside a big one and twisted the envelope together ever so slightly so that slightest movement would open it. Karen jiggled them open readily, and in a few more

> trials she was taking full responsibility for opening the shells to find the egg inside. (C.B.F.)

The first operation established playing with the small shell in Karen's repertoire. A sequence was then required in which one performance, lifting the large shell, led to the smaller one. Then the small shell reinforced successive approximations to opening the large shell. The chain of performances was constructed backwards beginning with the performance in the child's repertoire to reinforce the preceding one.

> 11:30. Karen had been sitting quietly for some time. Although she used to sob almost continuously, crying had diminished to a brief episode perhaps every hour. When she returned for lunch, with James, after being taken to the toilet and washed up, she was crying hard, as was James. The children sat at opposite ends of the table each with a bowl of soup. Karen took two or three spoonsful of soup, crying while she ate part of each spoonful. She then poured the soup into one of the egg shells she had brought to the table. Jeanne Simons then removed all of the egg shells, but substituted a second bowl so Karen could pour soup between the two bowls.

There is a stronger tendency to pour the soup and play with the dishes, than eat. Rather than prevent these activities Jeanne Simons allows it to occur in a slightly different context so that only a shift in the repertoire is required and not the elimination of a performance that is currently of great significance to the child. If Karen is to pour soup, using bowls is closer to an acceptable practice than using toys. Thus, some behavior is weakened but yet behavior relevant to the reinforcer is still maintained.

> Karen began reaching for James's food and dishes. She succeeded in getting his glass, but Jeanne Simons prevented her getting the soup bowl. For most of the lunch Karen gestured toward James's dishes, frequently reaching almost across the table. Crying continued unabated. When Karen poured James's milk into her soup, Jeanne Simons removed both the glass and the bowl. Karen threw some soup from the other bowl onto the floor, and she stopped crying while watching Jeanne Simons clean it up. By the end of the meal, however, Karen began taking small bites of cracker and sips of the milk. While the crying did not stop altogether, it diminished considerably. By 12:30, Karen was sitting quietly at the lunch table. (C.B.F.)

This was the first time Karen had eaten at the same table with another child. Previously, if there were any dishes on the table she would play with them rather than eat. The behavior in Karen, controlled by

James's food and dishes, was weakened by allowing her to engage in it in circumstances where Jeanne Simons could prevent its reinforcement. The frequency with which Karen reached for James's dishes was not allowed to be so high as to preempt Karen from eating her own food. This was done by placing James and Karen at opposite ends of the table. Crying was neither attended or ignored. It was simply irrelevant to the main direction of the interaction.

> Karen put the six pieces of the puzzle into place successively. After each piece Jeanne Simons gave her one of a set of telescoping cups. In two instances Karen didn't take the cup, but continued completing the puzzle. When Karen had gone through the puzzle twice, she had all of the cups and began stacking them, placing one inside the other. (C.B.F.)

Karen played with the cups frequently so they were used to reinforce working the puzzles. Her failure at one stage to take the cups suggests, however, that the puzzle activity itself is beginning to control Karen's performance and at least for a short time preempts control by the cups.

> March 29, 1965: Each time Karen ran across the room Jeanne Simons spoke vigorously with a lovely tone of voice. Karen appeared to be warm from the exercise so Jeanne Simons asked her to take her sweater off. When Karen did nothing, Jeanne Simons began taking the sweater off of Karen but stopped just before finishing saying, "Now you finish it. Take your hand out of the arm." Karen withdrew her hand and resumed running about the room as Jeanne Simons reacted vocally as before. Then, as Jeanne Simons opened her arms Karen periodically ran into them, and resumed running about after a hug and a small brief conversation in which Jeanne Simons spoke vocally and Karen spoke by body posture, eye focus and facial expression. (C.B.F.)

Jeanne Simons increased the frequency of Karen's running by her level inflected vocal reaction. She then added a second performance to the sequence--running into her arms which led to hugging and cuddling. The chain of performances actually has 3 components. Running about the room is reinforced by the vocal responses and Jeanne Simons opening her arms. Running to Jeanne Simons is reinforced by being picked,and being hugged is the occasion when they interact by voice, facial expression, and posture. Karen took her arm out of the sweater to be free of it. The restraint was an aversive stimulus that Karen's performance terminated. Jeanne Simons required just enough of the activity to be certain that Karen could accomplish it. She preceded the action by a comment that Karen could pay attention were she so disposed. Taking her arm out of the sleeve is the first approximation to Karen's taking the sweater off herself. Note that the performance Jeanne Simons began with was the last one in the normal sequence of taking off a sweater. As a result, Karen's action is the one that gets the sweater off.

Since Jeanne Simons arranges so many of Karen's experiences she is careful to extend Karen's social activities to other people. Paced with the new performances, Jeanne Simons arranges that other individuals at Linwood begin to support the new segments of Karen's repertoire. Should Jeanne Simons suddenly leave for a period of time there would not be a sudden loss of the new repertoire.

> At lunch time Karen had two cups, one with and one without milk. When Karen dropped the cup she was banging, Jeanne Simons took the full cup and placed it out of reach on the piano. (C.B.F.)

The second cup was designed to allow Karen to eat despite her compulsive play with dishes. It provided a separate occasion for playing and eating so that one would not preempt the other. The full cup of milk was removed because there was evidence that Karen would continue to throw the empty cup. Without the empty cup on the table it is likely that Karen will spill the milk.

> Karen then dropped the half sandwich that remained and finally the plate. Within 15 seconds after Karen dropped the sandwich and plate on the floor Jeanne Simons approached, picked up the plate and cup, placing them out of reach, and therein began an episode lasting for 27 minutes during which Jeanne Simons remained continuously with the child. Essentially she stayed in Karen's vicinity and prevented any activity other than picking up the sandwich. At the same time she held the milk out as a consequence of handing over the sandwich. All of these restrictions precipitated severe crying, foot-stamping, and thrashing about which persisted on and off through the whole period. (C.B.F.)

The severe tantrums, in contrast to the way Karen had previously cried softly, evenly, and continuously, is a by-produce of the new performance in Karen's repertoire. The crying here indicates an emotional reaction from Jeanne Simons's restrictions rather than (operant) crying to influence someone. The change in the severity and quality of the crying suggests the large degree of interpersonal control (relationship) that has developed. New performances now have a high enough frequency that Jeanne Simons is restricting the occasions on which they can occur. The tantrum is a result of Karen's being unable to eat her lunch and at the same time throw dishes onto the floor. Drinking milk is the performance which appears in the highest frequency and it is being used as a reinforcer. The episode is an example of setting limits. Playing with dishes postponed other reinforcers--drinking the milk and continuing with the meal, and hence becomes less frequent.

> The episode began at 12:04 and by 12:06 Karen handed Jeanne Simons the plate and the cup but the sandwich remained on the floor. Jeanne Simons repeated, "Give me your sandwich." Karen continued to look toward and gesture toward the milk which was placed on the table next to her. Jeanne Simons repeated, "Give me your sandwich." At this point Karen ran about as in a game. Jeanne Simons did not react to any of the performances and instead repeated, "Give me your sandwich," brought Karen back to the sandwich and at times brought the sandwich to another place and Karen to the sandwich. At 12:09 Jeanne Simons brought the milk in the vicinity of the sandwich. The sight of the milk precipitated even more extreme crying. By 12:12 the crying became even more violent. Karen at times was sitting almost on top of the sandwich. She stamped her feet and rocked back and forth with a vigor far exceeding her usual rocks. Jeanne Simons brought the plate down to the floor again asking Karen to put the sandwich on the plate. Karen did not comply. Jeanne Simons put the sandwich on the plate, asked Karen to lift the plate and the sandwich up to the table. 12:15, the milk is just to the left of Karen on the table but she stares fixedly at the bread crying. 12:16, Karen adjusted the position of the bread on the plate. The first time she dealt with it at all so far. Jeanne Simons did not conclude the episode with this approximation but said, "Put it on the table." 12:17, Karen picked it up about four inches. Jeanne Simons, "Put it on the table." 12:19, Jeanne Simons moved the sandwich and the milk about fifteen feet to the large table in the center of the room. At this point Karen took James's plate who was still sitting at the table staring fixedly off into the distance. Jeanne Simons quickly intercepted the plate and returned it to James even though he hadn't touched any of his food. 12:20, Karen sat on the floor near the place where the food was on the table. Jeanne Simons sat on the floor next to Karen, put Karen on her lap but Karen did not engage Jeanne Simons and left within fifteen or twenty seconds. 12:21, a full tantrum with severe rocking and hitting the floor with her feet. 12:22, Jeanne Simons put Karen on her lap and sat quietly holding Karen as she cried. 12:23, Karen pointed to the milk, Jeanne Simons, "You can have it" (without taking action). 12:24, Karen jumped up, stood in front of the milk, and touched the cup. Jeanne Simons withdrew it slightly, holding on to it, and pointed to the sandwich. Karen again stamped her feet and cried intensely. 12:25, Karen jumped to her feet quickly, stamping. 12:26, Karen picked up the sandwich and moved it about four inches. Jeanne Simons picked it up quickly, made a comment

> which signalled assent and brought the cup and sandwich to Karen's place at the table. Karen is seated before Jeanne Simons lets her touch the milk or sandwich. Karen continues to cry as she sits with the milk and sandwich although less intensely than before and with more frequent quiet periods until a counselor takes her for the rest period after lunch. Karen throughout didn't drink the milk or eat the sandwich.

The episode centered around Karen's picking up the sandwich. This was accomplished by preventing Karen from engaging in any other behavior. Jeanne Simons kept her in the vicinity of the sandwich or the sandwich in her vicinity and physically prevented Karen engaging any other aspect of the room. Jeanne Simons remained unreactive to any of Karen's performances so that these might not increase in frequency and preempt picking up the sandwich. Finally she simplified the task by keeping Kathy and the sandwich near each other and reducing the requirement to the kind of performance she judged Karen could successfully carry out. The entire episode was based on Karen's inclination to drink the milk and finish her lunch. This can be seen in the frequent attention Karen paid to the milk. The large scale tantrum and emotional upset appears to be caused by the interruption of her lunch and her attempt to take James's plate. The use of the food and the normal continuance of the luncheon as a reinforcer for picking up the sandwich was more an attempt at setting limits than a concern with the establishment in Karen's repertoire of picking up sandwiches. Karen on many other occasions had picked up objects from the floor and returned them to a table. The specification of conditions under which Karen could eat her lunch provided an opportunity for weakening primitive forms of behavior and strengthening normal forms of conduct for the treatment center. The narrowing of the conditions under which Karen could continue her lunch and the labelling of the throwing of the food and dish-throwing behavior as unacceptable was evidence of the progress Karen had made both in the durability of performances which had normal and significant effects on the environment and in the gain in the interpersonal relations with Jeanne Simons. If these performances did not have a high frequency of occurrence then it would not be possible to limit them. In other words, had Karen not persisted in all of the performances reinforced by getting Jeanne Simons's attention and the dishes the whole episode would have terminated very soon and there would have been no performances to limit.

Although Karen cried continuously throughout the entire episode it played very little part in the interaction except to indicate to Jeanne Simons by the change in its form of Karen's strong involvement in the situation. Because there was no special reactivity to crying either in an attempt to decrease its frequency or to react to it in any other way the interaction provided an environment which the crying probably decreased in frequency because of its irrelevance.

> Linwood, April 6: Karen was served lunch except for milk at noon. 12:22, Jeanne Simons gave Karen a glass of milk. Karen

> played with the dishes instead of drinking the milk and after about 15 or 20 seconds of moving the dishes about Jeanne Simons terminated the luncheon. Dishes were removed quickly. Karen's smock removed and in the manner of a game, Jeanne Simons led her to the rocking horse where she began singing rhythmically to Karen in cadence to her rocking movements, selectively reacting to straight up and down rocking movements whose frequency soon increased. After 5 or 10 minutes Mrs. Coleman took Karen to the toilet and thence to her next activity.

This was the first time Karen's meal was ended when she finished eating. Previously Karen was allowed to sit for the full hour with the dishes in front of her because of her compulsive involvement with them. These procedures appeared to be designed to limit the control over Karen's behavior by the dishes. The techniques involves removal of the stimuli which control the compulsive activity--the smock, the dishes, and the place at the table and to substitute the most durable behavior that Jeanne Simons could find in Karen's repertoire, the rocking horse to be prepotent over the tantrum that might be precipitated by the abbreviated lunch period.

> Linwood, April 20: Karen put a five-piece puzzle together. After each piece she played briefly with two Montessori toys, wooden forms into which cylinders of different diameters and lengths fit. When Karen picked up a cylinder, she tried out the various combinations of size and shape until she found a hole in which it fit. There were many more tries needed with the larger cylinders than with the smaller ones.

Although the cylinder form board was used as a reinforcer for the puzzle, it was of itself a reinforcer. The physical design of the toy reinforced, successively approximated, and conformed the child's behavior to its physical properties. The child's inclination to adjust his conduct with the cylinders until they fit, shows that simply completing the physical arrangement is the intrinsic reinforcer maintaining the performance. The several attempts needed to fit a piece into place are a schedule of reinforcement. The gradual increase in the number of performances needed to complete the puzzle developed persistence and frustration tolerance. To develop persistence and a sustained performance, the difficulty of the puzzle has to be very carefully paced to the child's current ability to persist. If too many performances are required for a particular stage the frequency of the performance will be reduced. Some puzzles are more difficult. Their physical design allows more unreinforced performances.

> Karen dropped one of the puzzles, immediately began crying. Jeanne Simons remarked that she thought this was one of the effects of having spent several days at home where the parents especially reacted to crying. She brought the puzzle closer to Karen, helped Karen to get down from the chair, but waited and maintained surveillance over the situation until Karen actually picked up the puzzle.

The episode involves a degree of aversive control because Karen is restricted temporarily until the puzzle is retrieved. The restriction is gentle but it involves keeping Karen in the vicinity of the puzzle and not permitting any competing behavior. Picking up the puzzle is reinforced by releasing the restriction. The restriction needs to be closely tied to the durability of the positively reinforced repertoire. The restriction is aversive only if it interrupts some positively reinforced behavior. The number of times Jeanne Simons has interrupted Karen's activities to set limits, or to weaken or strengthen a performance is evidence of how much positively reinforced behavior has emerged. Without it these mild, temporary restrictions would be meaningless.

> For the rest of the period Jeanne Simons shifted back and forth between James and Karen who were both seated at the same table. Karen assembled the cylinders in the appropriate holes of the wooden form after completing the six-piece puzzle. Then she was given the mailbox which had holes of different shapes into which the corresponding blocks would fit. The blocks could then be removed from inside lifting off the top of the mailbox. When Karen picked up a block, Jeanne Simons pointed to the appropriate hole in the mailbox toy and in some cases guided her hand. When Jeanne Simons shifted to James, Karen continued to play with the mailbox, first with the appropriate forms,but after a while the behavior shifted toward a simpler requirement in which she simply inserted plastic letters which fit into any hole. About six minutes later Jeanne Simons shifted back to Karen and required the correct form for the mailbox. Although Karen cried, she continued to engage Jeanne Simons in the structured activity with the mailbox toy. When Karen no longer was disposed to insert objects into the mailbox toy, Jeanne Simons switched to James, after first assigning Karen to another therapist.

The prompts by Jeanne Simons were successful, indicating that the performance of inserting the blocks into the mailbox were intrincially reinforcing. Karen's continued activity with the mailbox after Jeanne Simons shifted to the other child is further evidence of the mailbox'a structured control over Karen's behavior. The reinforcer turns out to be seeing the objects disappearing into the box rather than getting each block into its corresponding hole.

> Five minutes later Karen moved from the telephone to a set of plastic rings which she took apart, independently of anyone's attention or help. (C.B.F)

The performances with these two toys was a dramatic increase over what this child had done either at home or in the initial stages of her stay at Linwood. The reinforcer maintaining the performances was the changes in the physical structure of toys as they were assembled or disassembled.

The technique of working with two children at once made it possible for the therapist to shift back and forth very quickly depending upon the productivity and appropriateness of the child's behavior. Thus the therapist is more likely to be reactive to the more structured, productive elements of a child's repertoire than primitive ones.

> As soon as James entered the room he began putting the puzzles into place. When he finished putting the puzzles into place (approximately 4 minutes) Jeanne Simons gave him the cylinders. He was not able to put the cylinder into the appropriate hole so Jeanne Simons pointed to a hole whenever he picked up a cylinder. When James completed the puzzle and cylinders Jeanne Simons still swung him as before.

The amount of behavior reinforced by the playful swinging with Jeanne Simons is slowly being increased. Originally a one-piece puzzle was followed by playing; now James sustains a long chain of performances each quite structured. Several reinforcers sustained the performance. The puzzle is reinforced by the cylinder activity; both are reinforced by the play with Jeanne Simons. In addition, James's spontaneous return to the cylinders shows that the reactivity inherent in the holes of different sizes is sustaining the performance of inserting the cylinders. Completing the assembly of the cylinders becomes a reinforcer because it leads to play with Jeanns Simons. Because it is a component of a chain, Jeanne Simons provides collateral support (pointing to the appropriate hole when James tries to insert a cylinder) so that the task can be completed without requiring an amount of behavior that exceeds the child's capability at this stage. Pointing to the correct hole is an example of a non-vocal, verbal activity by which Jeanne Simons cues James's activity. The effectiveness of the prompt depends on James's inclination to complete the puzzle. Otherwise the gesture would have been a command rather than a prompt. James's involvement in the cylinders made possible a social interaction between him and Joe. There is the possibility, however, that Joe's help if too detailed will preempt James's behavior with the cylinders.

There was very clear evidence of the operant nature of Karen's crying in contrast to the even, steady, amorphous crying that Karen did when she first came. When Jeanne Simons required that Karen insert the correct form into the mailbox Karen cried. Her cries, however, were interspersed between smiling and laughing. Within a one-minute period Karen might shift four or five times from extreme crying to laughing and smiling.

This suggests that Karen's crying was now an operant performance rather than the diffuse emotional response it had previously been.

Therapy Activities of a Staff Member Trained in the Project

Descriptions of staff members who were trained during the project show the therapy procedures of Linwood in a slightly different context than they are carried out by Jeanns Simons. The following description, by John L. Cameron, was of a Linwood student therapist, Marsha Mitzburg, a junior college graduate who had no clinical or academic training in therapy before coming to Linwood. The four children assembled for two hours each morning in a space under the stair wall in the back of the entrance hall. These were all verbal children who were not quite ready for the school room yet, who had progressed verbally and socially so that they were too far along in their development for the other children. Hence the decision to set up the environment intermediate between the schoolroom and the simple environments of the others.

The teaching equipment included a token dispenser attached to matching-to-sample teaching machine, a Bell & Howell language master, (essentially a tape recorder) several study carrells, books, and workbooks and worksheets, and pictorial and number cards. At first it appeared as though Marsha were doing a great deal of talking. From a distance there was a constant faint chatter of her voice throughout the whole procedure. However, on closer observation this constant chatter was not the usual exhortative advice, with aversive effects of the average unskilled individual. The speech was closely related to what she did or required. It was clear that her activities were designed to get activities which were paced by her verbal behavior. The emphasis was on the child's active involvement in the classroom environment. Speech served as an instruction or advice rather than a goad to action. The group itself remained closely under her control throughout the period of observation with one exception--when one child became extremely vocally disruptive of the group activity and was promptly expelled and placed in the general activities' room so quickly that there was no observable effect on the other three. A few minutes later when the child had settled down he was returned to the group. With regard to the behavior of Marsha in minute interplay with the children the following is a typical example.

Theresa was copying out a series of words on a sheet of paper. Having completed the sheet, Theresa began to wiggle around and play with her pencil. When she stopped doing this Marsha called to her saying, "Do you wish me to correct what you have done?" The child made no response and began to fiddle again. Marsha continued with the work with another child who was working the teaching machine. When the child again stopped the disruptive activity, Marsha gave her further attention asking her again if she had completed her work and did she wish it corrected? At that point the child responded and was asked to come over to get the corrections made. The child threw the paper at the teache who said, "When you bring the paper to me, I will correct what you have do She then turned and continued with the other child. Theresa rose quietly, came around and picked up the paper and stayed with the teacher until the work was corrected. The work on the paper was not satisfactory, however, and she was handed another sheet of paper and instructed to complete the work in a tidy way. The child attempted to throw away the unsatisfactory copy but it was placed beside the new one with the instructions to use it for a model as for how it should not be done. Some of Marsha's activities in supervising the children's reading was particularly useful to watch. Her activities were at this point singularly stylized and her entire body remained quite motionless during the period when the child was not performing satisfactorily. The shift in her position at this time and her general activity was so marked that no one observing it could possibly miss what she was doing, and the corrective effect it had upon the child's behavior. When the child was trying to read, for example, following an error which had not been corrected, the teacher merely said, "There is an error," and blocked off the next line so that the child could not ignore what she was saying and go ahead. She herself remained motionless and unsmiling right beside the child, making no movement of any sort. When the child corrected the error, the teacher commented "Good" and at the same time, took the card that obscured the next line away so that the child could then proceed with the task.

The activities which were introduced for the children had obviously been carefully programmed. However, the programmed tasks were all the same, although the sequence which she used varied. The first task which the children were all engaged in in the initial period was the task of carefully copying from one side of a sheet of paper onto the other side. The letters were already written out so the main task was to complete the work accurately and carefully and tidily. She did not accept any correction. An error had to be erased. When an error occurred and the child untidily started to scribble she simply said, "No, erase it," if the child continued at that point she inhibited the activity by holding the child's hand until the child turned the pencil over in his or her hand and used the rubber eraser on the pencil marks on the page. The second activity was matching to sample, in which the stimulus such as the text "night" in the center of the card was the occasion on which the child chose one of the two pictures below, depicting day and night. The child then had to choose the picture which showed the night. She did not at any point engage herself with the child who was working with the teaching machine, but she had a timing device which allowed the child three minutes for four cards. The machine was so set so that a token was dispensed when the child completed four cards successfully in succession. When the child gave the token to the teacher, she could proceed to the next activity. Because a child might have to wait to use the matching-to-sample teaching machine there were cards available with a numeral on one side and the corresponding number word on the other side which were used during the delay. While Theresa was working on the teaching machine Marsha worked with the two waiting children, alternating her attention between them. She sat facing the two children, holding in her hand ten cards--on each card was written a number, say, one, and on the other side the word o-n-e. Facing child about, she went right through the card sequence in numbers simply holding the card up and when the child responded by reading correctly she said, "Good" and went on with the next card to the next child. She then turned the cards around and went through with the words and exactly the same way. Finally she began to mix cards and numbers up. During this period, although once or twice there was a slight delay during which period she remained motionless and said nothing, no child made a single error.

Sammy in the meantime was sitting, performing in his usual and negativistic way with a sheet of paper on which he was supposed to copy out words. It was quite striking that on the odd occasion when Marsha turned to him because he had completed something successfully he would then try to engage her in his typical negativistic manner. At that point she would rather quickly turn away and simply ignore what he had done, and she did not return her attention to him in any way until he had completed the next stage of his task. The first word on the sheet was "go." The second work was "top." When Sammy had written go, Marsha looked over, paid attention to the fact that he had correctly and tidily written the word "go" and said, "Good, Sammy, go on with the next one." He promptly said, "Stop go,stop go, stop go." At that point she turned away and left him alone.

When each child had completed the sequence of copying, doing the cards, working with the machine and reading, they were then allowed to put on their coats and go out and play. Apparently Marsha had it set up so that there was a specific play time, but each child could get out earlier by completing the tasks sooner. Consequently the first person to leave was Theresa, then Donald, then Frank, and I doubt very much, although I did not see it, whether Sammy managed it one second earlier. Theresa probably was out ten minutes earlier from the sequence, Frankie perhaps eight minutes, Donald four or five, Sammy, I don't think got out early at all.

This therapist's performance represents a blend between Linwood methods and their elucidation by reinforcement principles. Although John Cameron describes the procedures behaviorally and self-consciously, the appearance to a visitor is that of a skilled therapist. Visitors who had observed the same class session that John L. Cameron described remarked that "Her technique was excellent and she was a born therapist."

Increasing the Strength of Weak Behaviors

A common element among many therapeutic procedures is a method for increasing the strength of weak performances by giving them collateral support. A verbal prompt or a gesture is one form of collateral support as for example, when Jeanne Simons points to the particular hole into which the cylinder in the child's hand will fit. Frequently, however, the child's performance is made more likely to occur by actual physical restraint. Thus when James worked the puzzle for the first time Jeanne Simons stood behind him so that only movements in the direction of the puzzle could be made freely. In that position she also had the possibility of actually holding his arms and guiding their activity. Since the child had done very few puzzles and had not experienced the successful assembly of these unrelated pieces into an integrated pattern, the first puzzle needed to be a simple one in which only one piece had to be inserted. The piece in his hand and restrained in the vicinity of the puzzle, he had simply to release his fingers for the puzzle to drop into place. Collateral support was even possible for this performance when she tapped his hand gently to get him to relax his fingers for the piece to fall from his hand. Even such a simple puzzle will not fall into place accidentally but her position behind him with her arms around his, kept his hands in the vicinity of the puzzle so that an accidental movement knocking the puzzle piece into the position had a high probability of occurrence. This way of reducing the range of behavior the child can engage in by restricting his physical acitvity has the advantage that the degree of restriction can be very sensitively adjusted to the stage of development of the repertoire. As the child becomes more inclined to remain in the vicinity of the puzzle, the therapist can release the child's arms and eventually the child stands alone in front of more complicated puzzles. This progressive adjustment of the therapist's behavior to the child's capability is illustrated in the way in which the child is guided toward drawing. By holding the child's hands or wrists between the thumb and fourth finger, the other fingers are free to hold the child's entire hand so that the pencil does not fall out and to guide it to whatever degree is necessary. As the therapist feels the child's muscular control of the pencil, the second and third fingers may be released so that the child is holding the pencil and as the child's hand is moved across the paper by the therapist's thumb and fourth finger, the therapist can feel any movements that the child emits and correspondingly reduce the amount or extent to which the therapist guides the child's hands. Thus the amount of support that the therapist supplies to the child is delicately, continuously, and exactly paced to the amount needed to supplement the child's involvement. At the same time, allowing the child the maximum initiation of the performance

Setting Limits

Many examples in which limits have been set for a child's conduct have already been presented in the previous examples and descriptions. These generally involve situations in which the child engages in some form of conduct which is annoying or unacceptable to various people because the performance occurs at the wrong time or because it is a primitive form of behavior which annoys someone. In any case the general procedure as the previous examples have shown is to reduce the frequency of the performance by non-reinforcement. This is accomplished indirectly by specifying the form of behavior that is acceptable.

Setting limits implies there is an operant performance reinforced by its consequences whose frequency may be increased or decreased on one occasion or another depending whether it is reinforced or not. Thus the metaphor of a "limit" comes from an already existing operant performance whose frequency is limited. Tantrums and crying are one of the most frequent areas in which limits are required. The child who cries, however, may represent a continuum of behaviors ranging from a diffuse emotional response to a specific operant performance reinforced by a narrow, well-defined effect on the parent. The possibility of setting limits depends on identifying a reinforcer for the performance. The child, for example, who cries under circumstances when it would be most aversive and embarrassing to the parent is clearly engaging in an operant performance whose frequency can be limited by altering the parental reaction. The same problem arises when dealing with compulsive behaviors. Both therapist and parents are disposed to eliminate the compulsive behaviors either because it is annoying to them or because of their therapeutic goals. The specification of a performance as "compulsive" usually refers to its frequency, stereotopy, and resistance to change rather than its effect on the people around the child. The possibility of setting limits for a compulsive behavior depends, therefore, on whether the frequency of these performances is maintained by the annoying effect on those around the child or whether the compulsive behaviors are an indirect result of other aspects of the child's repertoire. In the long run, the frequency of compulsive behaviors will decline when other more productive modes of conduct become prepotent. For the more immediate therapeutic goals of a short-term interaction, the frequency of compulsive behaviors may be self-consciously decreased by the reinforcement of an incompatible performance which indirectly results in non-reinforcement of the compulsive behavior. The distinction between the circumstances when it is possible to set limits and when it is not is expressed clinically by determining whether the child is acting deliberately and consciously. If the child is acting deliberately and consciously then there is a performance reinforced by its consequences which can be shaped by altering the reactivity of the social environment therapeutically.

In practice the rule about whether and when a limit can be set for a child turns out to be a practical one. The degree to which a limit can be set depends upon whether the non-reinforcement that occurs in setting the limit will weaken the child's behavior in the situation to the point that he withdraws. If the child withdraws the whole notion of the limit is inapplicable since, as was discussed above, the limit implies some behavior whose occurrence is restricted to a particular time or whose topography is restricted to a particular form. The possibility of arranging a limit arises when a child forms some degree of interpersonal relationship with the therapist or acquires some performance under the control of the therapist. The basic behavioral process is that of bringing a performance under the control of the particular aspect of the environment that will support it. The development of the control by the environment (colloquially we speak of the child's noticing the environment) depends on whether he has any inclination to influence the environment. In this case, as in so many other therapeutic situations, the critical problem is to find some reactivity in the environment, either social or physical, maintaining the child's behavior. The circumstances under which the child can be successful is then progressively narrowed until the behavior is emitted appropriately so that it can be successful without the therapeutic support.

The question of whether the setting of the limit is an example of an arbitrary or natural form of control depends upon whether the criteria for limiting the child's conduct is to conform it to the natural features of the environment. Thus the therapeutic procedures are arbitrary only in that they are a temporary support of the child's behavior which keeps the productive aspects of his repertoire in sufficiently high frequency that it will survive the progressive shaping that is needed to conform it to the natural environment.

Examples of a Limit.

> Sol insisted on carrying a flashlight about with him wherever he went. When he went into the dining room Jeanne Simons began to limit this performance by requiring that he eat without the flashlight. She did this by asking him to suggest a place to keep it. Of the many suggestions which Sol made, Jeanne Simons accepted the top of the cabinet where he had to climb up with a chair and put the flashlight away before beginning his lunch. This requirement led to still another limit. When Sol insisted on a particular chair Jeanne Simons simply postponed the start of his lunch until he used whatever chair was available.

The setting of the limit in this case involved reducing the frequency of Sol's behavior with the flashlight by requiring that he eat lunch without it. Note that the reduction in the frequency of the performances with the flashlight carried out by emphasizing the frequency of very durable performances in Sol's repertoire such as eating lunch. The actual performance reinforced was one incompatible with the carrying of the flashlight around: putting it on top of the cabinet. The decision as to whether the frequency of carrying the flashlight could be limited depended upon the durability of the other items in Sol's repertoire which were used as a reinforcer for the incompatible performances. The therapeutic quality of the interchange came about from the careful sensing and continuous adjustment of the situation to the particular positively reinforced behaviors in Sol's repertoire. The situation could have degenerated into a power struggle had Jeanne Simons simply and arbitrarily decreed that he could not eat lunch while he carried his flashlight about. Instead she found some hiding place where he had some disposition to put the flashlight. The result was a structured series of performances involved in putting away and retrieving the flashlight which increased the structure of Sol's environment and his repertoire and indirectly decreased the frequency of carrying the flashlight about.

Food often provides a convenient situation in which to set limits.

> Jay Pilgrim is a mute child with a large potential for extreme atavistic behavior. He eats reliably and well but with his fingers. Dessert was the major part of his meal. Jeanne Simons required that he eat one spoonful, the first, before continuing with his fingers. There was quite a bit of tantrum and upset but she stood firm, withholding the ice cream and requiring more use of the spoon in successive approximations. Jay eats a spoonful of ice cream, then drops it and finishes the rest of the bowl with his hands.

Jeanne Simons now feels that if there is no increase in the frequency of eating the rest of the ice cream with the spoon that she will require that he take now two spoonsful before continuing with his hands. The new requirement will precipitate another strong tantrum; when the tantrum subsides she will require the whole bown by spoon.

The performance that is being limited is a class of behaviors reinforced by eating ice cream. Preventing Jay from eating ice cream with his hands allows the reinforcement of eating with a spoon. An indirect consequence of the limit is the temporary increase in frequency of crying and tantrums and the subsequent opportunity for their non-reinforcement. Indirectly the structuring of the eating experience leads to setting limits for crying and tantrums because these also have been operant performances which have led to important consequences for the child.

A reinforcer supporting very durable behavior and the requirement potentially within the child's repertoire the forms of conduct of which the child is capable is enlarged at the same time that atavistic behaviors are weakened.

> There were six children in the room. During the several hours these children were in the room, there was not one incident of any of the children approaching the teaching machine or disturbing any of the wiring on the relay rack. One child began jumping up and down on one of the couches and Jeanne Simons immediately moved him over to one particular couch which was reserved for jumping.

The appropriateness of the children's conduct to the physical feature of the room appears to come from limits such as those imposed on jumping. The emphasis is on a performance which the child is disposed to engage in. Rather than simply preventing the behavior, a circumstance is provided where the behaviors can be emitted and reinforced. The children have little inclination to operate on many features of the room (such as the windows and relay racks) because there is no performance in their repertoire appropriate to them. Because power struggles are avoided, the children are not inclined to annoy the staff, so there is no special reactivity on the part of the staff toward the possibility of a child pulling wires off of a relay rack or kicking out a window.

Using Strong Positive Reinforcers to Set Limits

> Francis. Francis frequently soils and has been somewhat of a problem. He was told that he could go to the ice cream parlor only if he didn't soil because it was extremely unpleasant for the rest of the people in the automobiles when he soiled. When he was given another chance, he appeared uncomfortable in the car and everyone was worried that he would have to soil, but as soon as he entered Linwood he immediately went up to the bathroom.

This is another illustration of the successfully limiting a performance, soiling, that depended on durable positively reinforced behavior, taking an auto trip to the ice cream parlor. To limit the soiling effectively there needed to be an inclination to go to the ice cream parlor without a power struggle. If Francis's soiling were a performance reinforced because it annoyed Jeanne Simons and others then the reinforcement of an incompatible performance, going for ice cream, would not have been possible.

Camping. Camping expeditions were important ways of building structured repertoires. Each child was slowly introduced to camping first by a brief visit to a camp site, then by more extended visits. Only children who are capable of functioning in the camping environment were allowed to go. The camping experience is validly and frankly used as a reinforcer. In order to get to the camp site you have to travel in a car. In order to travel in the car you will have to be continent, because Jeanne Simons will not allow you to travel in the car if you are incontinent. Jeanne Simons described a young girl who habitually urinated when she traveled in the car, but remained completely continent when she was told that she could not go in the car or go camping if she wet the seat.

The routines of camping are very much more readily adhered than at Linwood proper, because many of the requirements are supported by the physical environment. For example, the times when one can eat are limited by the necessity of putting out the fire and the necessity of putting food away from predatory animals. It is much easier to make exceptions to the normal eating pattern at Linwood. A child needs to be capable of remaining close to camp and within the sight of everyone because of the danger of being lost.

Excursions other than camping are used in similar ways. For example, one of the requirements of going shopping in a department store is the necessity of being alone for brief periods. Certain children can go shopping with Jeanne Simons if it is possible to leave them in a parcilular department for ten minutes while she goes for some item in another department. A child not capable of conforming to this requirement cannot go shopping.

Variability in Setting Limits

Persons vary in how rigidly or narrowly a limit is set. This variability provides a convenient safety valve for untoward effects of setting limits. In the previous example in which a child was required to use a spoon, some staff members might simply remind the child or admonish him verbally while others, perhaps more experienced therapists, would remove the child's dessert as soon as he began eating without a spoon, returning it only when he picked up his spoon. Such variability in the practices of the therapeutic environment comes partly from the presence of staff members of varying degrees of professional training. The errors of the non-professional, however, have a useful purpose to the child because they are a natural transition to environments where people will not always behave "therapeutically." The therapists and the less-professional staff members have very different relationships with the child. The consequences of the non-professional staff member allowing the child to eat with his hands are very different than if this were done by the professional who in general deals with the child at more difficult times and is involved in setting limits more frequently. Despite the different ways limits are set, the average effect on the child provides a steady pressure in the direction of using a spoon, yet the demand is not so inflexible that it precipitates a fight between child and staff. It more resembles the successive approximation inherent in normal grown and development. Many other types of interactions with the children have this same inherent variability as for example, when one therapist requires greater conformity to a criterion than another.

The Necessity of Setting Limits Requires Special Staff.

Jeanne Simons discussed her plans for the operation of the program room and the new staff. Groups of 7 to 10 children, each led by two staff members are planned. Jeanne Simons will circulate among the groups spending perhaps one-half hour with each, observing, discussing the procedures and problems and demonstrating procedures. A floating staff member will have the job of assisting in difficult situations. For example, the floating staff member would step in when a special procedure produces a tantrum or disruptions of a child which would interfere with the normal group and which would require special handling by one person. The lack of this kind of person limits the conduct of therapists who might be reluctant to precipitate a critical outcome because the child can effectively "blackmail" the therapist by a disruptive performance, which will interfere with others. For example, should it be decided that a child goes outside to the sandbox after completing a certain activity or only if he has his shoes on, then the floating person could fill in at this time if the child posed special problems. Otherwise, one child could hold up six others from going to the sandbox by being difficult. In addition to interfering with the activity of the group, the manipulation of the group might reinforce the disruptive behavior. The two persons per group also provide for an apprenticeship for a new therapist. A most effective reinforcer for developing the relevant skills is a direct interaction with the child under the appropriate circumstances.

The small children, probably under 5, will work predominantly in the board room, and a separate fenced area will be constructed outside. Although some special activities for the other children may be carried out in the board room they will in general be kept separate from the other children.

Therapeutic Use of Meal Time to Set Limits and Reinforce Productive Behavior.

Although the arbitrary use of food to reinforce behavior has many disadvantages clinically (Chapter 3), the meal time provides an important therapeutic opportunity in which food reinforcement plays a critical part. The following observations of a verbal, autistic girl illustrates how food was used in the natural context of a meal to limit extreme kinds of conduct in the dining room.

> Setting: The children had entered the dining hall for lunch and most of them were seated at a table. There was no table setting, however, and there was no food on the table.
>
> Jeanne Simons put a plate before Dorothy who was seated at the table which contained small pieces of bologna. The plate was placed in front of Dorothy before there was any verbal request or any kind of gesture. Then Jeanne Simons walked over to Dorothy and added a piece of bread with mustard which she cut in very small pieces. Dorothy immediately began to eat the bologna using her fingers. When Dorothy's plate was empty, Miss Singer immediately put a few more pieces of bologna on the plate. Again Dorothy had made no verbal request for more meat. While there was still a few pieces of meat on her plate, Dorothy called, "More meat, more meat" four or five times. Jeanne Simons did not look in her direction or make any indication of awareness of her request. When Dorothy was quiet Jeanne Simons walked to her and patted her on the head, and later with her plate still empty a few more pieces of meat and some small pieces of mustard bread were put on her plate. When Dorothy emptied her plate she held it up in the air rapidly saying, "May I have some meat, may I have some meat?" Jeanne Simons very quickly brought a few more pieces of meat.

> When Dorothy was settled and quiet in her place, Jeanne Simons brought more meat and said, "That's my girl." Dorothy then began to spit out some of the bread she was chewing. Jeanne Simons said,"Dorothy, put it in your mouth and eat it." Dorothy again spit out the bread, this time on the table and Jeanne Simons removed the plate. When Dorothy turned to Jeanne Simons who was walking away with the plate and called, "Eat," the plate was returned while Dorothy chewed and swallowed the remaining piece of bread. Jeanne Simons said, "That's my girl." Jeanne Simons removed the plate with a few pieces of meat remaining on it, replaced it with one containing very small pieces of mustard bread as she said, "Dorothy put this in your mouth and chew it, that's my girl." Once again on the last bite, Dorothy spit it out. Very gently holding her hand, Jeanne Simons moved it to pick up the bread and returned it to Dorothy's mouth. Dorothy's mouth was tipped up by lifting her chin. Saying "That's my girl," as Dorothy completed each of the component performances, Miss Singer brought a cup of water and offered it to Dorothy, who took a drink. Then Jeanne Simons asked, "Is it gone?" Dorothy opened her mouth immediately and Jeanne Simons replied, "That's my girl." Dorothy then asked for more water and took two or three swallows from the glass which Jeanne Simons gave her. When all of the bread was gone, Jeanne Simons returned Dorothy's meat plate. After eating two or three pieces, Dorothy picked up a handful of the bologna, gave a little cry and shook her body vigorously two or three times. Jeanne Simons asked, "What is it you want, Dorothy? You don't have to eat it but don't play with it." Jeanne Simons then brought Dorothy a glass of milk. Dorothy then played with the bologna using her hands for a few minutes. Jeanne Simons once again removed the plate saying, "We don't play with it, Dorothy." Without a dish in front of her, Dorothy reached for Karen's meat who was sitting right beside her. Jeanne Simons brought back Dorothy's plate which now contained one piece of meat, saying, "Eat the meat." Dorothy again played with the meat, instead of eating. Jeanne Simons took the plate away saying, "O.K.,that's all darling," and the luncheon period was ended. (C.B.F.)

The interactions with Dorothy centered around attempts to reduce the frequency of playing with food, throwing it on the floor, and extensive verbal demands for food, and to increase the frequency of normal eating. The inappropriate verbal activity for food was in general preempted by putting food on her plate before she had a chance to ask for it. The playing with food was reduced by giving Dorothy just enough food that she could eat. When she finished one piece she was given more. The conditions under which additional meat was given to the girl was when she had finished the previous portion and when she was behaving appropriately at the dining room table. There is verbal reinforcement of chewing and swallowing meat and collateral support for chewing and swallowing by Jeanne Simons tipping Dorothy's head back and giving her a drink of water, and frequent verbal reaction whenever Dorothy chewed and swallowed. Limits were set by removing the plate when she began playing with the food and requiring that Dorothy pick up and swallow food which she had spit out before she received any more.

> Linwood; May 18, 1965. Karen entered the board room first, running, smiling, and engaging other activities. She ran to the horse and jiggled it; she got her chair, sat down, adjusted herself in it, and sat with her hands in front of her at the table; her eyes followed many people about the room; she smiled frequently, vocalized and waited patiently for lunch as she interacted attentively with the scene. Lunch was with James, Max, Karen and Tom, and consisted, among other things, of a large plate with cold cuts cut in small pieces. The pieces of meat were passed out in small portions to each of the children throughout the meal. Jeanne Simons set the occasion each time she gave meat by speaking. Karen reached for more meat and otherwise gestured while her mouth was still full. Jeanne Simons held Karen's plate from her and asked her to swallow what she had. Karen persisted for about 15 to 30 seconds in gesturing for more meat before she finally swallowed the meat in her mouth and received a new portion. During this period Max and Tom were pretty much left alone. At 11:58 Tom had a small tantrum and Jeanne Simons encouraged him to cry, rather than ignoring him. Along series of statements like: "It's all right, cry." "Come on, Tom. You can cry." Tom grimaced, shuddered, tensed his facial and throat muscles, but the major effect was that the frequency of this semi-crying reduced and he became calm and ate without much upset. Tom is an autistic child who seldom vocalizes or makes any loud noises, even in distress.
>
> Max climbed over the table to get more meat and Jeanne Simons did not interfere with him even though she could have easily. Tom then cried aloud, Jeanne Simons unbuttoned his shirt and he engaged in all of the facial expressions associated with crying, but no vocalizations. Jeanne Simons held him in her lap during this time encouraging him to cry. Tom sat on Jeanne Simons's lap as she said, "That's better. Go ahead and scream some more," each time Tom made a sound. The general plan seems to be to increase the frequency and magnitude of Tom's crying by following it with attention and appropriate verbal behavior which Tom appears to be sensitive to. James started to bite Max, but Jeanne Simons caught him

> in time with the statement, "Don't bite," as she restrained him. At 12:09 Max is at the piano hitting the keys. James left the table and lolled on the couch nearby while Tom grabbed for more meat. Jeanne Simons, however, interferes and gives him the meat herself. At 12:10 Jeanne Simons asked Max to come and get his applesauce but he doesn't come. She leads him from the piano partially to the table and when he is close to the table, he goes the rest of the distance and sits down of his own accord.

This is another example of the collateral support of otherwise weak performances. Max's inclination to come to the table to eat the applesauce was not sufficient to attract him from across the room, but once in the vicinity of the table the applesauce controls him sufficiently to sit down and eat. The incident is an illustration of the frugality of Max's repertoire that such a small chain of performances could not be sustained.

> Karen dropped a cooky on the floor but gets off the chair, picks it up and climbs back herself.

The many previous incidences where Jeanne Simons made it possible for Karen to pick up objects from the floor and get back to the table, rocking horse, or wherever else she was playing may be responsible for the high frequency of dropping and picking up objects. It is quite possible that dropping the cooky was an emitted operant performance rather than an accident, because the activity of dropping and picking up things is an intrinsically playful and rewarding sequence.

> At 12:12 the children are all sitting around the table and as they reach for things she interposes herself, giving the child what he could have reached for. Exceptions, however, are liberally interspersed as at 12:13 when Tom took the rest of the plate of meat himself without Jeanne Simons interposing herself by passing it. Jeanne Simons cues each one of her activities by some comment. For example, before giving Karen the meat, she pauses for two or three seconds while she says, "Meat, meat," and thenhands the meat. Other times she describes what she's doing as she does it.

Jeanne Simons's speech serves as a cue (discriminative stimulus) rather than a command of the child's behavior. In many instances Jeanne Simons has interposed herself between some effect on the environment which the child could achieve directly as for example, when she gives Karen a piece of meat which Karen could have taken with her hands. Such intervention between the child's action and the reinforcer maintaining allows Jeanne Simons to enter into a relationship with the child because she becomes an occasion for the child achieving an important effect on the environment. In behavioral language she becomes part of a chain of performances so that her actions become a conditioned reinforcer.

> At 12:14 Tom went to the cabinet and took a toy out before anyone could prevent him. A staff person was the first to the scene and asked, "Can he have it?" Jeanne Simons came over, took the toy, held it in front of Tom and said, "Say 'uh' Tom and you can have it." Tom does not say 'uh' and Jeanne Simons compromises by getting the cylinders which she then requires Tom to do before he gets the take-apart toy which he had taken from the cabinet.

Here is an example of avoidance of a power struggle with a child. Rather than simply take away the toy which he had snatched from the cabinet Jeanne Simons decided to use it as a reinforcer for a vocal performance. When the vocal performance was not emitted, however, she immediately shifted to another performance which she knew to be in Tom's repertoire and which had a high enough frequency of occurrence that she could require it of him. Even though she compromised, Tom didn't get the toy from the cabinet without the interposition of Jeanne Simons and a performance of her choosing.

> Throughout the preceding events Karen picks things up off the floor and places them on the table and vice versa. At 12:18 Karen reaches for some of the food and dishes in Max's place and she is prevented with a statement, "That's Max's, Karen." Tom is reassembling the toy which he received as a consequence of putting the cylinders in the proper form. At 12:19 Tom returned the toy to the staff person and he left when Jeanne Simons told him to go outside to the playground. At 12:20 when Max got the pyramid of rings that Tom had been playing with and he played with themeffectively, as Tom had, without any collateral support or comment from anyone. Jeanne Simons remarked that it was still too early to demand or reinforce any behavior in Max. 12:21 Jeanne Simons: "Karen, wipe off your mouth," as Jeanne Simons wipes Karen's mouth with a napkin in Karen's hand. Karen vocalizes very loudly, protesting slightly in response to Jeanne Simons wiping her mouth. Jeanne Simons continues wiping paying no attention to the small protest. Max has successfully disassembled, reassembled, disassembled, and further reassembled the rings. At 12:24 James is still lolling on the couch. Karen takes a paper cup which had had milk in it at lunch and put it on the stirrup of the rocking horse. She then went back to get James's cup which still had milk in it and got it to her mouth and began drinking from it before Jeanne Simons could intercept it. Jeanne Simons: "You win, Karen. Aren't you proud of yourself getting away with it?" Karen finished drinking the rest of the milk and immediately takes the second cup to the

> horse and puts it on the stirrup as before. It probably would be not too far amiss to speculate that Karen's drinking Max's milk was an operant reinforced by getting an empty cup which could be placed on the handle of the rocking horse. Jeanne Simons then took the cup from Karen, put a hole through the bottom so it could be put on the stirrup's peg more easily.

Although all of these activities occurred at meal time it is interesting to note the range of performances and reinforcers with which Jeanne Simons worked included many others than food. Jeanne Simons's verbal activity provided an important role during the entire luncheon. Her speech, however, was not a critical event at any point which forced any activity from the children. Rather her speech set the occasion for critical occurrences such as the passing of food so that her speaking became a positive significant occasion. It is unlikely that the children attended in detail to every word she said, but the way in which she cued her activities increased the likelihood of their attending to ehr speech on subsequent occasions. Jeanne Simons cued every statement with the use of the child's name. Even if the child did not react to all the nuances of the speech, he still experienced different consequences for his behavior when his name was mentioned than when it was not.

There were few interactions with James who was left alone during most of the time. This occurred because James was relatively new at Linwood and not yet begun emitting much behavior for which a relevant reinforcer had been discovered.

Tantrums and Self-Destructive Behavior

One of the characteristics of tantrums and self-destructive behavior is the enormous control they exert on the adults around the child, frequently to the disadvantage of both.

> Matt, a large, strong autistic boy who became very upset and went into a tantrum whenever his request for a sandwich had been denied was causing considerable difficulty with the staff and the other children. At one point everyone was observed to be rushing around to make sure that he got his sandwich in time in order to prevent the tantrum and upset which resulted when he did not. The fact that the tantrum and emotional upset was precipitated by strong performances reinforced by a sandwich provided an opportunity for using this behavior to structure the boy's environment Jeanne Simons therefore instructed the staff to require that Matt be seated calmly before the sandwich is given to him. At first he needed to simply be on the chair, but the period slowly increased until he could wait for even several minutes.

Chapter 4

Children who throw tantrums and otherwise disrupt those around them tend to be segregated from their usual group. Frequently they are removed to another room where they can be with another adult who can manage them. Ideally the person caring for the upset child is busy with some task that preempts the attention that the child's tantrum might otherwise draw. Technically the situation might be described as a person who is engaged in some performance which is maintained in a sufficiently high frequency so that it is prepotent over the avoidance and escape behaviors which might be generated by the aversive effects of the child's tantrum. Thus the child has the protection of an adult, there is a chance for the primitive behaviors to occur without reinforcement, and the adult has some activities to engage in which can prevent him from being unduly sensitive to the behaviors of the child which might otherwise be compelling.

Linwood, April 20: The night nurse described how she handled Waldo in the bathtub. Waldo had been teasing both she and Mrs. Harris by splashing water on them and throwing towels in the tub. When Waldo splashed water on her watch she didn't react at all since the watch was waterproof. Later she told him, "Waldo, if you think my watch is dirty why don't you take the wash cloth and the soap and wash it off instead of just splashing water on it." He lost interest immediately. She ignored Waldo completely when he threw towels in the tub. In contrast, both of these maneuvers annoyed another nurse and Waldo persisted in teasing her with them. The night nurse said that the way to handle children whose motive is to annoy is to not allow the child to have that effect on you.

It would be difficult not to be annoyed without a waterproof watch, however. This points to the necessity of arranging an environment around these children such that the child cannot control the staff by worrying them about damage to valuable possessions such as a good watch or expensive clothing. But even without sensitive objects the children will naturally probe the reactivity of those around by trying various activities, some of which will be annoying. The adults' response to what is annoying will be a critical variable in whether the child continues to react. In some cases, simple non-reactivity is not an adequate answer, because the child may continue to persist because of a long history of having a major effect on other people in the past. In other cases a child will annoy one person because of the collateral reaction produced on another person in the vicinity. An effective technique is frequently to simply reverse the child's control of the situation by imposing a requirement on the child controlling you. In an extreme case this may consist of restraining the child.

The following account is of a child who needed to be restrained.

> Since Waldo was a large muscular child whose physical activities could be quite destructive to the children and adults about him

> Jeanne Simons frequently intervened herself and took his shoes to protect herself from injury. She could then also use the shoes later as a reinforcer. The tantrum was so severe, however, that she was not able to prevent him from injuring himself or objects in the room. She called for a bed sheet which she fastened around his waist twisting the remaining ends so that she could hold him at a distance. This allowed Jeanne Simons to prevent his injuring himself and objects in the room as well as restraining his activity. As Waldo calmed down she relaxed the tension on the sheet and the amount of restraint. As he became violent she reapplied it. This continued for some time, perhaps 40 or 50 minutes, until Waldo began complaining of the restraint and requested that he be able to leave the room. At this point, Jeanne Simons began to specify the conditions under which he could leave. These conditions mostly involved performances which were incompatible with violent activity and which showed that he was no longer in a tantrum. For example, she required that he take her hand lightly as they walked together to the couch to put on his shoes. Once there she required that he participate in putting his shoes back on.

The use of restraint here was to reinforce (negatively) behaviors which were incompatible with the tantrum. Thus the sheet was relaxed when Waldo and Miss Simons began to deal with each other in any sort of normal fashion. It was taken off altogether when Waldo showed some inclination to engage in normal activities such as leaving the room to another place. When he proved to be incapable of walking calmly to the couch with Jeanne Simons, it was reapplied. Thus the restraint was sensitively paced to the child's ability to control itself and engage in normal conduct. The whole episode could also be described as a reversal of the controller and controllee. The episode begins with Waldo in control of the situation applying an aversive stimulus of such magnitude that they preempted the behavior of all those people around him. Jeanne Simons's actions in response to this was to reverse the direction of the control and arrange procedures so that she could specify the kinds of ways she would react to Waldo's behavior to increase its frequency.

The following account reverses the usual pattern where the tantrum involves a crying and emotional upset which decreases in frequency as a result of the therapeutic intervention. Max was an autistic child who smiled, kissed and made statements like, "I love you," "Do you love me?" compulsively and repeatedly.

> Linwood, March 2, 1965: At about 4:00 p.m. Max ran up the main stairway and broke a window. Jeanne Simons came quickly from another floor of Linwood, called for a sheet which she fastened around his waist and kept him with her in this way until suppertime. For the first 15 or 20 minutes Max treated the

> situation as a game. He smiled, interacted with her in his normal manner saying things like, "Do you love me?" and smiling. Jeanne Simons kept a very severe demeanor all through this, frequently criticized him for breaking the window. Yet throughout all of this he continued to smile, remain pleasant, and in general engaged in the type of verbal action and facial expression which made me use a certain amount of self control to keep from smiling and assuming a genial manner with him. By the time the dinner was imminent, however, he began showing some instances of changes in mood toward discomfort, and by the time the other children went in to dinner he was crying. While Jeanne Simons served supper she tied his sheet to the chair and said in the presence of the other children, "If we can't trust you to wander around safely, then you will have to be tied down so we know where you are." Now he screamed and cried, made quite a fuss and the dinner hour was quite noisy and disrupted for the first 20 minutes. He later calmed down, however. He threw his food on the floor once but no reaction was paid to this, other than picking it up and removing the rest of his supper so he couldn't throw any more. He remained in the dining room throughout, however, tied to the bench. He cried most of the supper hour.

This is the first time that this kind of constraint has produced a severe and adverse reaction from this boy. Here we have the opposite of the usual picture where the typical social interaction is one of ativism. In this boy's case the result of placing a limit is the appearance of an atavism in contrast to the usual case in other autistic children of the disappearance of the ativism.

> Waldo, November 4: Just before lunch on the way to the washroom Waldo threw a violent tantrum while he was with one of the schoolroom teachers. Jeanne Simons rushes downstairs, took off his shoes, and he quieted down in a few minutes. She then gave him back his shoes, and asked him to put them on, and during the next few minutes other children with whom he ordinarily dealt came around to see what was happening, and she suggested that they help him put on the shoes. A minor project then followed with four children all eagerly trying to help Waldo put on his shoes with all kinds of conversation and interaction among them including Waldo.

This is a very interesting example of using a tantrum for another purpose. The episode was a significant interpersonal interaction for the four children and particularly Waldo who was actively engaged during the dressing.

> Waldo continued to show signs of tantrums and destructiveness during most of the day, but a full-blown episode never really

occurred. After supper in the evening he was heard to be screaming as was Simon. Jeanne Simons came down to notice that he had been hitting Simon and engaging in a minor tantrum. She ignored this and approached Boris and several other children suggesting that they come up into her room to see a star she had constructed out of some plastic clip-together toys. They asked Waldo whether he wanted to come along and he simply glowered and stayed. Once they were upstairs the other children were quite engaged by the plastic star Jeanne Simons had constructed and probably to some extent by her suggestion Boris took the star downstairs to show to Waldo who got all excited about it and of his own accord decided to come upstairs. As he turned to leave, he turned to Simon saying, "I'm sorry I hit you, Simon."

Use of Performances Incompatible with Self Injury. An example of the use of an incompatible performance to reduce the frequency of an act occurred at Linwood; when Jeanne Simons was taking Dorothy downstairs after she had "illegally come up to the third floor." She began hitting herself on the way down and Jeanne Simons asked her to hold onto the bannister walking down. This verbal instruction strengthening grasping the bannister was sufficient to control the hands in the position incompatible with hitting herself. The disposition to strike herself was obviously less than the strength of the behavior controlled by the bannister and Jeanne Simons's instruction.

Verbal Behavior

Arthur Nixon is a husky 9-year old, who speaks a lot, mostly echoically. When he came to Linwood he beat his chest with his hands to the point where he became black and blue, and repeated everything that was said to him over and over again, particularly when they were an instruction, a reprimand, or a command. He did the same when he overheard remarks made to other children. His voice had a peculiar gutteral quality made by tightening up the voice apparatus in the back part of the mouth. This week at supper Jeanne Simons began extinguishing the echoic behavior. The supper provided a very good occasion because she had an effective reinforcer there. Each time something was needed like more meat or milk or dessert, Arthur would beat his chest and vocalize gutterally or he would imitate one of the other children's request. If he asked for something and was told to wait a minute, he would repeat, "Wait a minute," "Wait a minute." Jeanne Simons reduced the amount of vocal interaction with the other children to the point where he had very little to echo. Everything she said to him she whispered to him but kept it to a minimum. As she withheld consequences for his chest beating and unnatural gutteral tonal quality, one time he said in a normal voice, "I want milk," instead of the usual, "Arthur wants milk."

The result was dramatic within the course of three or four supper hours. The frequency of the chest beating declined dramatically, in spite of its persistence for several years. Arthur Nixon provides an interesting case of the separate functioning of different kinds of speech. The fact that he has an echoic repertoire does not necessarily mean that the same verbal forms are an effective part of his repertoire in other forms such as a request, demand or a description of an event. The very complete echoic repertoire, which consists of a very careful production of virtually any speech sound he hears occurs in spite of the complete absence of any other functional kinds of verbal behavior.

> Ricky Sanders repeats an answer rather than answering appropriately. Jeanne Simons's advice was to keep him calm and engaged until he spoke appropriately. His speech could be described as generally weak rather than missing or incomplete. One finds even in intact children that very weak speech sometimes occurs with a latency of as much as five minutes.

A problem in developing and increasing the frequency of some of these weak performances with autistic children is the prepotency and disturbing effect of performances that intervene during the long latency preceding an utterance. Dr. Schultz commented that Ricky really doesn't know what talking is; that he thinks it's like working with a speech therapist. Eric and Adrian Daniels are similar cases in which the richness of the verbal repertoire is particularly misleading. Adrian, for example, will engage in a long monologue in which he asks questions and produces a continuous response from his listener. Yet his speech is highly aversive to the listener and the behavior is functionally not that of conversation. In the same way Ricky Sanders's verbal behavior is very strongly echoic without much ability to sustain a long utterance without a strong echoic prompt. The problem is much like that of second language instruction where the student may learn to memorize and parrot long sections in the second language from a text but is unable to speak in the same context to a listener. Modern linguists start out with the goal of developing a repertoire under the control of a listener. In assessing the verbal behavior of disturbed children it is important to recognize the functional relation of the speech to the listener and the other aspects of the child's verbal environment. Even though the vocalizations appear the same form as in normal usage their functional significance in the repertoire may be entirely different. For example, a child who can repeat a long sentence, word for word, cannot necessarily engage in these verbal responses in conversation or produce them without the prior stimulus. In another sense the child who may use some words with apparent appropriateness may be lacking many of the grammatical forms that are so necessary for communication. The child who can name a book or a pencil still needs to say and understand, "This is *not* a book, " or "*If* you want the book, get the pencil *first*."

> Vocal Behavior in a Group. On Wednesday morning another group of five children took part in an experience designed to successively approximate speech. Jeanne Simons took a cardboard tube and the five children in the board room. The five were capable of carrying degrees of speech ranging from George who squeals through David who speaks reasonably fluently. She started with "Toot, toot," and passed the cardboard tube around giving a child a piece of candy if they emitted an approximation of "Toot, toot" relative to his ability. David, the first time, said, "I want a piece of candy," through the tube, but he wasn't given anything. She simply took it back and went, "Toot, toot," then when David on the second time said, "Toot, toot. I want a piece of candy," she gave him a piece of candy. George spit the first time and was given nothing and she simply passed the tube around to the next child. The second time through he squealed into the tube and he got a piece of candy for this.

The social facilitations within the group and the possibility of a second trial with a demonstration all created a situation in which there was continuous reinforcement of some behaviors and non-reinforcement of others. The many "small" reinforcers and the easy pace of the group provided a situation in which extinction would not have severe effects because there were no large consequences of any instance of non-reinforcement. A critical part of this procedure appeared to be the use of the group which permitted a low rate of behavior for each child, perhaps one-fifth the rate that would be required if the child were alone with the therapist. The multiple control of the therapist by the five children simultaneously tended to minimize the domination of the therapist by the child. The mixed range of repertoires in the children provided a model which kept the therapist differentially reinforcing in the direction of the maximum repertoire, while yet still maintaining contact with the current repertoires of each child.

> Informal Reinforcement of Speaking by Food. Jeanne Simons brought toast and coffee for herself and extra pieces of toast and jelly for the children. She sat at the big table in the board room with Donald and Jimmy on either side. The general procedure was for Jeanne Simons while having her coffee and toast to say to Donald, "Say 'toast,' Donald." Donald vocalized quite a bit but only part of these vocalizations were close enough to toast so that she gave him a piece. Only an understandable word was acceptable and the reinforcement was a full half piece of toast. Many of these children frequently will eat only the center of bread and leave most of the leftover insisting that they get another piece. So with Donald. Jeanne Simons instead of urging him to eat the crust tore off a piece, gave it to Donald and put the rest of the piece back in her tray from whence she gave him the remaining pieces until he had finished all. I would judge that had she left the bread

> out on the table and urged Donald to eat it all, that he would have refused asking for a new piece. Jimmy emitted almost no vocal behavior, but near the very end of "breakfast" he ran over to a nearby couch and with his head buried in a pillow mumbled something or other which I couldn't hear from the distance. Jeanne Simons gave him a piece of toast saying, "That's good enough this time. Next time you'll do a little more." Throughout the whole episode there were no tantrums, crying or even the slightest hint of atavistic behavior. Both children stayed in the close vicinity of Jeanne Simons throughout. It was as if this was their scene of the play. During the rest of the morning they went about other activities in the room without spending much time in her vicinity.

Much of the deliberate reinforcement of speech occurs when children ask for food or some object. When they are already speaking to some extent, the object is withheld for a short time as the child is asked to name it, as with the toast in the preceding interaction.

Most of these incidents occur spontaneously when a particular child, showing some general disposition to vocalize, requests something.

> Peter reached for a piece of cheese and Jeanne Simons withheld it saying, "Cheese." He said "bear" repeatedly and he then drifted to "bu, bu, bu." Later when he reached for a bear, Jeanne Simons held it in front of him saying, "It's a bear." He was given a bear three times as a result of saying a reasonably good approximation of the word "bear." For each acceptable vocalization, Peter tried about twice unsuccessfully. Thus the experience provided differential reinforcement in favor of the correct articulation pattern as well as the use of speech in a socially appropriate way.

Developing Speech

Although the preceding examples illustrated situations in which explicit reinforcers were used to increase the frequency of vocal sounds and the articulation patterns of appropriate speech, very few situations are observed at Linwood where a concerted effort is made to develop speech by explicitly reinforcing it or successively approximating it beginning with primitive sounds which are progressively refined. Rather the emphasis is on the use of speech to cue and prompt the child's environment so that he begins to attend to, use, and notice the speech of those around him. Under these conditions children will spontaneously begin to imitate sounds and occasionally say words and it is at this point that the therapeutic environment can move in to pick up the child's inclination to speak and expand it.

Chapter 4

Theoretically an operant reinforcement analysis of the development of verbal behavior would lead to a similar attack on the problem. Verbal behavior is primarily a performance reinforced by its effect on another person. Therefore a primary repertoire, before there is any possibility of the development of verbal forms, is those behaviors whose reinforcement can be expedited or mediated by another person. Until another person's behavior is important for the reinforcement of items in the child's repertoire there is no possible reinforcer for speaking, and none of the reactivity in the natural social environment could maintain speech. The way in which the child's inclination to engage the individuals around him socially depends on collateral performances as has been discussed in Chapter 1. Simple forms of conduct make possible simple conditioned reinforcers and chains of performances a variety of chains of behaviors which effect the physical and social environment in different ways raise the possibility of other persons becoming steps in achieving these reinforcers and hence, generalized reinforcement. Finally verbal behavior as the most effective way of influencing another person socially comes about through generalized reinforcement. Through most of these stages of development, the appropriate form of verbal interaction with the child is to cue or prompt his behavior so as to facilitate it. Thus, when Jeanne Simons points to the appropriate hole into which a cylinder will fit she increases the likelihood that the child will pay attention to her gestures and look to her for advice, if getting the cylinders into the form is indeed a reinforcing event. The use of the child's name individually and in a group cues many behaviors which are reinforced when the child is named and not otherwise. The next step is the child's use of his own name and later other children's.

CHAPTER 5

TRAINING PROCEDURES AND MATERIALS FOR PRINCIPLES OF REINFORCEMENT

Since the main purpose of the project was to explore the usefulness of general principles of behavior as a foundation for clinical training, the search for means of imparting principles of reinforcement to the clinical staff was a critical task. A decision was made early in the project not to teach specific techniques of behavioral control but instead emphasize a communicable language with which the clinical teachers could communicate with the students. The following text, from the preface to Behavior Principles, describes the content and aims which evolved finally.

> This book is designed to make the reader proficient in analyzing man's complex interaction with his natural environment. It does so by developing his understanding of basic behavioral processes and refining his skill in the detailed observation of behavior. There are already many textbooks which convincingly argue the case for the scientific analysis of behavior as a proper approach to important human problems. Some of these stress the theory and philosophy of science; others present empirical evidence proving that human behavior has been modified by the systematic application of known principles. This book has a different aim. It assumes that the student recognizes the relevance of a science of behavior to the problems of human conduct, and undertakes to teach him how to carry out a behavioral analysis.
>
> Initially, the text focuses on examples of animal behavior to show basic behavioral principles at work in their simplest forms. These principles are then extended to human behavior through descriptions of performances in the natural environment. Increasingly complex behaviors are progressively presented, pacing the student's growing fluency in technical description.
>
> We do not assume that the student has prior knowledge of psychology. Nor do we intend that the examples of behavioral control we have cited are practical methods the student is advised to use; rather they should be considered as exercises in analysis. While it is true that through a course of instruction based on this book the student may ultimately learn how to alter behavior effectively in the home, the clinic, the laboratory, or the classroom, our primary concern is not so much to teach a method of controlling behavior as to provide a vocabulary for describing behavioral phenomena in the natural environment.

The student's practical ability to use the skills developed in the course will depend to a significant degree on the collateral skills he brings to it. The experienced clinician may discover rewarding techniques for supplementing or modifying his current procedures. The practicing teacher may find many principles of behavior applicable to classroom activity. The college student majoring in psychology should acquire a basic tool to implement his understanding of various content areas in his chosen field. The graduate student in psychology or education, whose familiarity with behavioral analysis has been derived from the literature on the application of behavioral principles to practical problems, can gain insight into the underlying behavioral processes. Professionals in the mental health field who have already achieved maturity in their own specializations will acquire a simple objective language enabling them to communicate, with great precision, their own findings to their students and to others.

As a result of pilot courses based on this text, psychiatrists reformulated their experiences with their patients; therapists at the Linwood Children's Center learned simpler ways to describe the behavior of their youngsters; housewives reported themselves dealing more effectively with children, dogs--and husbands.

In content, the book addresses itself to three main questions:

1. How does the organism add new performances to its repertoire during growth and development, and after maturing?

2. Once behavior is in the repertoire, how is it strengthened or weakened?

3. How do the features of the environment cue the operant and reflex performances of the organism?

Thus, the main focus of the text is upon general principles of operant and reflex behavior. Many content areas which are normally part of an introductory course, such as those of intelligence testing, individual differences, and sensory capacity are not included. They have been omitted, not because they are less important, but because the authors feel that a general technical analysis of operant and reflex behavior is a prerequisite to their discussion.

On the other hand, the area of verbal behavior is covered in considerable detail and far more technically than is usual in an introductory text. Not only does the student have sufficient preparation at this stage to understand it, but an analysis of

> such an important content area provides him with further opportunity to practice his newly acquired skills in the functional analysis of behavior.
>
> Many textbooks present theory, then buttress theory with facts. This book reverses the sequence. Most chapters are presented at four verbal levels: (1) an instruction or outline of the general content of the section, (2) a non-technical but factual description of a behavioral event, (3) a description of the event in technical terms and (4) a discussion, usually theoretical, of the interrelations between technical terms. In Chapter Four, for example, Part I states that the text will deal with the many ways in which a reflex (already described in the previous chapter) may be controlled by the environment. Part II then goes on to describe the conditioned reflex, after which several reflexes are discussed in technical terms in Part III. Finally, in Part IV, there is a discussion of the conditioned reflex as a bridge between reflex and operant behavior. In Parts II and III, many examples of human and animal behavior expose the student to technical description and opportunities to practice it. The theoretical issues of Part IV are presented only after the student can discuss pertinent performances in relation to their controlling environment.

Since there was no experience about how the knowledge of general principles of behavior could be integrated into practical training problems, we approached the training task in two separate phases at first. In the first phase of the training program we taught general principles of behavior to the principles of the project, Jeanne Simons, Dr. Cameron, Dr. Schultz, Mrs. Mitchell, and later to the clinical trainees. When we had sufficient experience about the way the students incorporated these principles and extended them to clinical problems we turned to the problem of bridging the general principles of behavior with the practical problem of dealing with the children. By this time a formal clinical training program began to develop which provided some of the curricular materials to which behavior principles could be applied. Because the training program proceeded in two discrete phases, academic and clinical, it will be possible to describe the academic training program and the methods which were discovered for imparting it to the staff in this chapter and the way this knowledge was adapted to practical and clinical tasks in the next.

Teaching Behavior Principles and Developing the Relevant Content

The decision was made very early in the training program that the clinical students needed a technical and fluent grasp of behavior principles far beyond the casual or recognition level that results from many didactic or formal lecture programs. Because successful clinical work required attention to the minute moment-to-moment details of the patient's conduct, the level of experimental analysis that the student needed to be capable of had to be sufficiently rigorous to describe complex interactions technically. The same level detail is required in a technical analysis as the level that is required in therapy work. This requirement of a complete, fluent grasp of a technical language sufficient to describe the complexities of the natural environment led to a search for a method of instruction that would guarantee complete mastery of each part of the curriculum before the student went on to the next and that would give the student an ability to speak in depth and in detail rather than to react passively.

The requirement of a high level of mastery led to the interview procedure in which each student was required to demonstrate orally to one of the project listeners all of the verbal behavior he was expected to develop from study of an assigned portion of the texts. When an interview was completed successfully, the student went on to the next part of the course. The interview procedure gave the project staff data about the students' progress besides its contribution to guaranteeing the students' performance on one part of the course before he went on to the next. The academic training program was an experiment where the verbal behavior generated by the curriculum as well as the student's performance at Linwood could be observed. As a result of this detailed data from the impact of each part of text, the content as well as the style of presentation of the textual material was continuously revised. The clinical examples brought up by the students suggested the kind of behavioral descriptions and problems most relevant to the student's repertoire. In many cases it was possible to incorporate the student's very language into the text when it appeared more effective than the textual materials. At other times when the textual materials appeared incomplete and the student was unable to speak adequately even after intensive study a tutorial period with a project staff member provided the missing material which needed to be added to the course.

When drafts of the academic training program were completed, tests were carried out in classroom situations at the University of Maryland College of Education to gain further experience with the novel method of teaching and the usefulness of the content of the course for various kinds of persons interested in understanding and describing human behavior.[1] The first course was given informally at the Counseling Center of the University of Maryland, mainly to post-doctoral professionals in psychology and related mental health fields. A second course was given for graduate credit in the School of Education mainly for students preparing for counseling.

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[1] These opportunities for experimenting with the course materials and teaching methods were made possible by Dr. Thomas Magoon, Director of the Counseling Center; Dr. George Marx, Chairman of the Department of Counseling; and Dr. Alan Leventhal, Professor of Psychology and Assistant Director of the Counseling Center.

Chapter 5

The following text, from Behavior Principles, describes the rationale for the interview procedure

> Guaranteeing the Student's Repertoire
>
> Defining the goals and content of a book by no means guarantees that the student will actually achieve the intended repertoire. Many established classroom practices provide at least partial solutions to this critical problem. We propose to describe in the Introduction certain teaching arrangements, developed during the design of the book, which course instructors may find additionally helpful in the normal classroom situations to which this book is addressed.
>
> Our method owes a very substantial debt to experiments carried out by F. S. Keller and others who developed procedures to encourage students to work through texts effectively by insuring that they had mastery of one part before going on to the next. These experiments involved radical rearrangements of the classroom environment, and were designed to reinforce directly those behaviors whose establishment was the goal of the course of instruction. The concepts resemble those of programmed teaching, but they are broader. Keller described the relationship of his procedures to programmed instruction in these words:
>
> The learning situation that I have just described is similar in several ways to that provided in the field of teaching machines, programmed textbooks, and computer-based instruction. There is the same stress upon initial analysis and organization of the subject matter to be taught; there is the same concern with the terminal behavior to be established in the repertory of each student; the same provision for individualized advancement when clearly specified requirements have been satisfied; and the same possibility of program self-correction on the basis of student reactions.
>
> The sphere of action in this course, however, is much larger. It approximates the total educational process. The steps of advance are not "frames" in a "set." They resemble more closely the usual homework or laboratory assignment. The "response" upon which a student's progress depends is not simply the completion of a prepared statement through the insertion of a word or phrase. Rather, it may be thought of as the result of many such responses. better described as the understanding of a principle, a formula, a concept, or the ability to use an experimental technique. Advance within the program depends on something more than the appearance of a confirming word or the presentation of a new frame; it involves a personal interaction between a student and his peer, or his better, in what may be a lively verbal interchange, of interest and importance to each

participant. The use of a programmed text, a teaching machine, or some form of computer aid within such a course is entirely possible, and may even be desirable, but it is not to be equated with the course itself.

In the preparation of this book, we experimented with various ways to guarantee that the student was prepared for each new section he undertook. The most useful technique proved to be an interview in which the student talked with an instructor, a course assistant, or another student who had just completed the chapter. The interviewer's task was to serve as a skilled listener to whom the student could demonstrate his newly developed behavior. In general the interviewer's role was to evaluate the completeness of the student's coverage and to encourage behavior potentially in the student's repertoire rather than to tutor him. The student advanced to the next section when he could speak fluently about the preceding one. If he could not, he restudied the text before scheduling another interview.

Although the interview procedure proved to be a practical teaching technique, we first used it as a way to evaluate the effectiveness of the text. Since we had direct evidence from previous interviews that the student had mastered the material up to that point, we had to suspect that the cause of any subsequent difficulties he might be experiencing lay in the organization of the current chapter. If it became clear that the text was incomplete, we bridged the gap by tutoring the student. The content of the tutorial then provided the basis for adding new text or rewriting the old text. Many revisions were prompted by the interviews.

The arrangement of the book in chapters of three to five parts, each four to six pages long, enabled us to keep a very close check on whether the presentation of the material was properly paced and sufficiently clear. At the end of each part, a series of study questions provided the interviewer with a schemata for evaluating the student's performance, and provided the student with prompts similar to those he would encounter in the interview, if he wished to examine himself prior to scheduling an interview. Thus, there were three to five interviews for each chapter.

The interviewer took written notes to help remember the interview without interrupting the student. After the interview, the interviewer consciously limited his speech to attempts to strengthen, rearrange, or supplement behaviors which the student already possessed. If the interviewer judged that the student did not speak fluently enough in the general content area of the chapter to benefit from minor prompts, the student went back to the text for further study. The interviewer supplied reminders of omitted topics after the student finished speaking. The purpose of the interview, therefore, was not to create a tutorial situation, but to provide a knowledgeable listener to whom the student could demonstrate the behavior he had developed as a result of studying the text. The interview not only enabled the instructor to evaluate the preceding study activity, but provided the student with a reinforcement of it.

A Comparison of the Interview and a Test or Examination

It was important that the interview not be conducted like the usual test or examination that penalizes the student when he fails but allows him to go on even though he has achieved only partial mastery. The usual test tends to develop in the student only those minimal behaviors necessary to pass. Thus, the test may be a fallacious measurement of the behavior that the course intends to develop, and cramming for it is likely to reinforce undesirable behaviors far from its projected goals.

In contrast to the test, the interview is a direct measurement of the student's entire repertoire. If the interview is complete, there is little possibility of its reinforcing a performance that is relevant to a test but not to the aim of the course. The only consequence of an incomplete interview is an instruction to restudy a part of the text. Whenever the student completes a part successfully he will have achieved perfect mastery whether or not he did it the first time he tried. The interview, as a demonstration of the entire repertoire proposed by the text, encourages the kind of study that leads to reliably fluent speech. Part of the objection to a written test would be overcome if perfect mastery were required and no penalty imposed for incomplete mastery.

The Relation Between the Performance in the Interview and the Study Behavior Needed to Generate It

Technically, the interview is a reinforcer which shapes and maintains the kind of study behavior that can lead to fluency about the subject. The relation between the interview and the study behavior it generates is a delicate one which can be illustrated in many situations where new verbal behavior is being formed. The following experiment, in which a five-year-old boy was taught to read, illustrates how the interview operates in a simpler situation. The experiment used a simple teaching machine in which the child could press a button under either of two texts: _cat_ or _dog_. With one type of card the child saw a picture of a cat. With another, the child heard _cat_ when he put the card in a tape recorder. If, when looking at a picture of a cat or hearing the word _cat_, the child pushed a button under the text _cat_, the machine made a sound indicating a correct performance; after four successive correct performances, the machine delivered a token which could be cashed for toys. If, however, the child pushed the button under the text dog, the child would need to repeat the four cards until he got all four cards successively correct. Other cards, of course, required the choice of the text dog. Although the child made some progress toward reading skill, his performance was sloppy and uneven. Many errors occurred. The child fidgeted, was distracted by anyone who passed, and occasionally pushed one of the buttons accidentally with his elbow while his eyes wandered the room (typical behavior, perhaps, of most very small boys in a classroom but not conducive to learning to read).

We speculated that the boy was not performing accurately because the reinforcement occurred after pressing buttons rather than after the actual performance we intended to produce. We therefore decided to reinforce reading directly. Now the child was given a pack of four word-cards and told, "Study these cards on the machine. When you are all through, bring them to me and I'll see if you can read them." When the child brought the cards back and read them correctly, he was given a token. If he was unable to read the cards, the instructor returned them and said, "I think you'd better go back and study them on the machine some more. Come back when you can read them."

Almost immediately there was a shift in the child's performance. He became intent on the machine. His lips moved and his finger hesitated as he shifted from choice to choice before pushing a button. A new set of subtle behaviors was being reinforced which was difficult to specify, but which made clear that reinforcement of the actual reading performance rather than the button pressing had shifted the repertoire dramatically. Once reinforcement occurred directly as a result of reading, the child was inclined to develop the study behaviors that led to reading.

By extension, the interview technique proposed by this book generates the special kind of study behavior the student needs to achieve mastery of the material and a fluent, technical, and meaningful vocabulary to convey his knowledge.

Carrying Out an Interview

The instructions to the student for carrying out an interview should be fairly explicit:

An interview should last approximately ten minutes. If the student cannot substantially paraphrase the part under review in ten minutes, he should go back for further study and schedule another interview after gaining a little more fluency in the materials.

> The interviewer should speak only on three occasions: (1) At the beginning of the interview when he may tell the student what is expected of him during the interview. (2) After the student has completed his discussion of the chapter and cannot say anything more, the interviewer may summarize very briefly what the student has covered, mention any topics which have been omitted, and point out any errors of fact or terminology. (3) After the student has completed the remaining topics, the interviewer may give the student instructions for further study, or end the interview with a general remark.
>
> To prevent inappropriate interruptions and to help him recall the content of the interview, the interviewer should equip himself with paper and pencil to record inaccuracies and omissions. The student should keep the text in front of him while speaking. The measure of his facility with the material is his ease in paraphrasing the text meaningfully within the allotted time, not his ability to memorize the chapter.
>
> These procedures are intended to discourage digressions and conversation during the interview period. Informal discussions between students and instructors will be much more useful after the interview has proved and improved the student's fluency.
>
> Examples of student interviews demonstrating the kinds of interchanges that may take place in an interview will be presented at the end of the Introduction.

As a result of the teaching experiments the course procedures using the interview and Behavior Principles were adopted to the author's Introductory Psychology Course at Georgetown University. The following text[2] describes how the new teaching procedures were applied to a standard Lib eral Arts College course with 90 students. The refinement of the teaching methods and the data from observing the students will amplify the general properties of the teaching methods that emerged from Linwood.

Course Procedures

The primary procedure of the course is the interview which one student schedules with another after reading a part of the assigned text, usually ten to fifteen pages. The interview is a formal arrangement in which the listener who has already read that part of the text uses a timer and listens to the speaker without interruptions. Both students refer to text or notes as they speak. After the speaker finishes talking, the listener comments on how the speaker covered the topic of the text, mentions important omissions, corrects inaccuracies of concept of language, or converses on some aspect of the subject matter. If both students are satisfied that the interview shows mastery of the text, they record the results on a class chart and the speaker finds another student to whom he speaks. If not, the speaker restudies the part and repeats the interview. Each student is required to listen once for each time he speaks. At the end of three to five sections (a chapter) the student takes a brief quiz to demonstrate his mastery of the course. There are five or six versions of each quiz, called written exercises to avoid the pejorative connotations of an examination. These are taken from essay study questions of which there are typically 10 or 15 for each Part or 60 for each Chapter. The study questions also give the students a rough guide as to the detail and penetration of study required. The written exercises are graded by the section assistant and if it is satisfactory, the student goes on to do interviews on the next chapter. If it is not satisfactory, a remedial procedure is discussed with the instructor or section assistant. There is a brief conference with a course assistant or instructor following each written exercise.

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[2] This text is taken from the article, "Individual instruction in a large introductory psychology college course," by C. B. Ferster, Psychological Record, 1968

The student's grade is determined by how much of the course of study he completes. A grade of "C" required approximately three-fourths of the amount of study needed for an "A." Complete mastery, however, was required at any level for course credit. There were no penalties for review of repetition of a written exercise. A student who failed to achieve mastery was given special help until the difficulty was diagnosed and mastery achieved. A final examination, a two-hour essay, taken from the hundreds of study questions which the student had used in his study of the text, served as a final check on the student's mastery and to formally certify the student for course credit to the registrar.

The course content was defined by 8 Chapters of Behavior Principles (Ferster and Perrott, 1968), a text describing general principles of operant reinforcement, articles covering a range of general topics in psychology from the Scientific American and chapters on "Personality" (Lundin, 1966), "Measurement" (Horowitz, 1966), and "Child Development" (Smith, 1966). The four-credit course met for an hour on each of four days. Later, at the students' request, class time was extended for an additional hour on two or the class periods. One hour each week was designated for lecture and discussion but attendance was optional and students could do interviews and written exercises during lecture periods. Lecture periods were spent discussing topics of general interest to the students such as psychoanalysis, study procedures, psychotherapy, and child rearing problems. These discussions served as occasions to demonstrate the use of the experimental language about behavior which the student was learning.

The students were assigned to one of five sections (approximately 17 students in each) each led by an upperclass psychology major who had already been through the course. The course assistants kept the records of the students' progress through the course, scheduled interviews assigned, graded and discussed the results of written exercises, discussed problems and content with students and kept the course instructor informed about the events in his section. The course instructor observed all of the class procedures, answered questions or discussed content with individual students and sought out students who were behind schedule or had special problems. The course assistants met with the instructor weekly to discuss special problems, exchange experiences and consider changes in course procedure.

The course met in a large lecture room with approximately 250 seats. The five sections of the room were identified by large placards suspended from the ceiling at the rear. The course assistants sat at tables in the front of the room or in one of the seats in the classroom. Students moved about the room freely and sat in neighboring seats to carry out interviews. Two students seated close together were not disturbed by the overall noise level of the room. If the noise level was unusually high they put their heads closer together. A nearby classroom was available, however, as a quiet room in which students could study or take written exercises. Three to six students were seen daily in the quiet room. The noise level of the class, a continuous low hum, was not very difficult to overcome. Many of the students read and took written exercises right in the classroom.

Results

Of the 91 students who enrolled for the course 81 remained after two weeks, and 79 completed the course for credit: 90% with A's, 4% with B's and 6% with C's. The final examination, two hours long, and composed of short essay questions selected from the several hundred study questions which the student used in the study of the text, was intended to certify the student for course credit. Although the examination questions were very detailed, nearly all of the students answered them technically and in the same detail as in their original study. Only two people had unsatisfactory final examinations and both difficulties cleared up on retest.

Students went through the course at different rates. Thirty-six percent of the class finished the course including final examination three weeks before the end of the semester. Seventy-two percent of the class finished the course including the final examination before the last day of class.

Figure 1 shows the percentage of students doing one, two, or more than two interviews on each of the class days of the course. Taking the class on the average, the frequency of interviews (hence, study) increased as the course progressed. Figure 2 shows percentage of students absent from class during the semester. Although attendance ranged widely, the modal attendance was of the order of 60% or 70%. The daily cycle of absences was probably a result of the students' overall study schedule. The peak absences occurred on Fridays and the least absences on Tuesdays. Course attendance clearly reflected mid-term and other examinations in other classes. Figure 3 shows the frequency of those students who came to class but did not interview. These students may have read, listened to another student, or carried out a written exercise. Except for the two days before and the one day after Christmas attendance rose substantially in the period following Thanksgiving compared with the first 30 class periods. Conversely, there was a decreased frequency of attendance at lectures and conversation with the course instructor during this period. The large number of people present but not speaking during the final session were taking the final examination.

Figure 4 contains records for six students who exemplify the range of individual performances that was encountered. Each curve, for an individual student, shows the cumulative number of interviews plotted by consecutive scheduled class periods. Fifty-nine interviews were required to complete the course. A student working at constant rate and finishing the course on the last day of the semester would produce a straight line beginning at origin and ending at the intersection of the 50th class period and the 59th interview. To conserve space and to make comparisons between the students easier, all of the curves are placed on the same coordinate by displacing them slightly in the vertical direction. The bottom record is that of a student who dropped the course. For the first month he attended class regularly but for the most part sat in the rear of the room reading. The course instructor had several conferences with him in which he appeared as a very depressed, anxious student who was having difficulties with all of his courses. The course instructor introduced him to several of his classmates who were at the same stage of the course as he, inquired of his progress weekly, and discussed study habits and methods with him. The rate of progress through the course increased as did his mood and level of social activity in class but his rate of progress was still not high enough to complete the course by the end of the semester without jeopardizing the rest of his courses which he possibly could pass by studying for the examinations. For this student there would have been merit in extending the course limit indefinitely. The experience of study leading to mastery and the successful completion of a course at the A-level might have been a significant experience for this student.

The second curve from the bottom is for a student who did very little during the first half of the semester, finishing the course with a sustained period of activity near the end. The open circles on the first part of the graph show that this student did most of his studying in class for the first part of the semester. When asked, during the 38th class period, about his performance, he replied that he was occupied with "other things" and that he would soon begin working on the course.

The third curve is for a student who decided to settle for a "C" or who increased his rate of work too late. The large number of classes which the student attended but did not interview suggests that he was doing little out of class study during most of the course.

The fourth curve is characteristic of most of the students. Progress is slow but steady until Christmas when the students hit a rate of work which completes the course approximately on the last day of classes. These students appear to be pacing themselves.

The top two curves are for two students who worked at a sustained pace from the start. The student represented in the top curve finished the course several weeks before the end of the semester. The student represented in the 5th curve was absent from class for several weeks just before the end of the semester, probably to study for another course.

When a written exercise given after a chapter did not show mastery the section leader conversed with the student about the topics in the written exercise. If the student appeared to be competent orally he was allowed to go on, despite the incomplete or inaccurate written exercise, to the interviews of the next chapter. Since the student's deficiency was in written communication rather than content, he was asked to do another exercise on the material he had just mastered orally to give him practice in writing. Most of the students quickly learned to do written exercises that matched the level of their oral fluency. Conversely those students whose written exercises did not show enough mastery of the course were also unable to speak competently in conversation about the content covered by the written exercise. With these students, the section leaders discussed the interview procedure, the student's study activity and asked that the interviews on the chapter in question be repeated. If the student continued to have difficulty in speaking accurately and fluently about the current chapter, the section leader or the course instructor listened to an interview and helped the student restudy (on the spot) those parts of the sections not adequately enunciated during the interview. For most students several experiences at this level developed the study behavior needed to speak fluently about the course content. For a few it was necessary to reduce the assignment to half sections (about 1200 to 1500 words) so as to give the student the experience of mastery after sustained intensive study behavior that it would have been impossible to complete the course within the semester. These students were also having great difficulty in completing assignments in their other courses.

Chapter 5

Discussion

The interview is probably the experience in the course primarily responsible for the student's fluent active speaking repertoire. It provided an experience, closely following study activity, which exposed the new performances acquired as a result of study of the text. Because the student speaks in detail about a small amount of text (approximately 3,000 words), there is a fine grain relationship between the student's interview performance and the study behavior that preceded. The speaking student is his own listener and reacts to subtle differences in the fluency, accuracy, and depth of coverage of his presentation. This differential reactivity of the student to his own speech reinforces these subtle aspects of his study activity with the text which produce a competent vocal essay. Most students developed improved study skills which they extended to other courses. Besides providing subtle differential reinforcement of study behavior the interview also is a motivational device. The interview helps maintain the student's overall activity in the course because it exposes at frequent intervals his progress through the course. Many students reported that the speaking experience during the interviews increased their ability to express themselves elsewhere and improved their social ease.

The listener's role in the interview is mostly to make it possible for the speaker to speak since it is almost impossible for most people to speak alone. The listener cannot reinforce the speaker's behavior as subtly as the speaker himself since he is not nearly so reactive to the critical nuances of the speaker's behavior. Therefore, the decision about the adequacy of the interview came from the speaker rather than from the listener. Most students improved their style of study continuously as they noticed small deficiencies in their performance during the interview. When the quality of the interview did not improve over several chapters, some kind of remedial experience was used such as restudy or study methods. The student's perceptiveness about the nuances of his own performance was probably due in some part to the absence of penalties in the interview.

Just as the speaker is his own listener, the listener may be talking to himself as he listens. The listener is particularly able to take part in such a silent conversation because he has himself just been engaging in the same behavior as the speaker and hence could have as easily said the same things. Because of these latent verbal behaviors, verbal stimuli from the speaker can prompt verbal performances which would otherwise need to be composed and emitted. The listener, therefore, is free to combine verbal behaviors from a wide variety of past experiences with those prompted by the student who is speaking. Students often report that they combine behaviors from their common personal experience with the vocabulary and content of the interview in a way that would not have been likely otherwise.

It was important that the speaker not be interrupted during the interview lest the frequency and fluency of the speaker's behavior be progressively reduced. The speaker's behavior is weakened by interruptions because they are aversive or because they supply prompts which shift the control of the speaker's behavior away from the preceding study behavior with the text. The listener took written notes to remember the interview and commented freely after the interview refraining, however, from tutoring the speaker. Comments were consciously limited to attempts to strengthen, rearrange, recombine, or supplement behaviors already in the speaker's repertoire. Otherwise, the interaction would weaken the speaker's subsequent study behavior.

The Written Exercise

The written exercise given after each chapter was a conventional test rather than an exposure of the entire repertoire as in the interview. The tests, frequently as they were given, provided only a sample of the student's language from which the instructors could judge technical accuracy and fluency. The tests were used, therefore, as diagnostic information for certifying the student's progress through the course, and as a basis for suggesting remedial procedures. The written exercise only sampled the student's performance, it was not designed to reinforce the nuances of study behavior that are required for proper comprehension of the course content. There was not sufficient point-to-point correspondence between the study behavior and the written exercise to produce such a delicate result.

The conference with the student course assistant following the written exercise was the main point of personal contact with the student. These brief conferences with student assistants were effective because they were brief, frequent, interactive experiences with an individual student, and because the undergraduate instructor, recently a student himself, had a repertoire very close to that of the student. The interaction between the student and course instructor over the written exercise probably prevented a slow drift in the student's criterion of course mastery.

The Role of the Course Instructor

Much of the course instructor's work needed to be done before the course started. The student assistants had to be appointed and trained; texts needed to be selected that could generate mastery without rote memorization; the amount of text required of the student needed to be defined carefully because the student was required to master it all at high level of comprehension; study questions needed to be written for all of the texts and their frequency and thematic content designed to define the depth of penetration that was expected of the students; criteria for grading needed to be established and procedures arranged for introducing the students to the course procedures; record forms and charts had to be prepared for taking data of the students' progress in the course, for a permanent record, and for display to the students.

Once the course began, the course instructor's time was used flexibly. Free time was needed to observe the class and to listen to selected interviews. Individual students approached the instructor in class with questions or for an opportunity to converse but most students were concerned largely with acquiring mastery and credit for the course through study, interviews, and written exercises. Lectures were well attended at the start of the course, perhaps as a carry-over from students' past course experience and because of interest in the instructor's style. Attendance for lectures finally settled at 8-15 persons, usually those who were on the schedule. It is probably best to schedule lectures and free discussion at a time that does not compete with course activities that bring the student toward completion of the course requirements.

Just as students who were making good progress through the course sought out the instructor in lecture, discussion, and casual conversation, the course instructor sought out those students who were lagging or otherwise having difficulty. Discussions were held individually with these students to find out why progress through the course was slow, or to find the basis for other difficulties. When a particular problem was identified, the course instructor continued to monitor the student's behavior by direct observation and interviews, and by conversation with the section leader.

The Design of the Text

Although the basic operation of the course did not depend on any special textual material, almost half of the course was based on Behavior Principles, a textbook whose design came from a self-conscious application of principles of reinforcement. Behavior Principles was composed under close control of an actual reader, who carried out interviews based on a draft from part of the text. When it appeared that an incomplete interview was due to a defect in the text rather than student's study behavior, a tutorial was carried out which then served as a guide for rewriting or adding to the text. Often the tutorial provided the actual language for the text revisions. The behavior generated by the interview put the writer closely under the control of the reader since he had detailed evidence of the behavior that the text generated in the student. The division of the chapters into parts, topographically by headings and page separation and functionally by the study questions and interviews, had significant motivational effects. The smaller sub-units within chapters made the study experience more reactive than would be the case when the study unit is larger. Theoretically, each interview reinforced a small fixed-ratio schedule of reinforcement, and the successive interviews within a chapter were conditioned reinforcers leading to completion of the chapter.

Most of the study questions were in the form, "After reading this part, you should be able to..." They were designed to instruct the student how to study each part of the text. At one stage of study, for example, a student would be expected to describe a reflex and an operant technically. At another stage the student might be expected to comment theoretically about operants and reflexes saying just how they differ, what sources of confusion are and reasons of making the distinctions. The actual facts the student analyzes might be very similar in the two cases, the differences being mainly in what kind of study behavior the student engages in about them. The study questions were numerous enough so that there was a point to point relation between small parts of the text and a study question. The study questions, like the chapter sub-divisions, defined small unit of the text. The unit of text defined by a study question varied from several sentences to several paragraphs. Like the interview, each study question served as a conditioned reinforcer for the part of the text it defined and contributed to the reactivity of the study experience.

Abstract thinking was developed first by teaching the student the component performances and then rearranging them under the control of general statements. Thus, when the concept of chaining is introduced in Chapter 7, the student can already speak fluently about many sequences of performances and stimuli. For example, he can describe a pigeon pecking a key as a sequence in which only pecks of a certain form are followed instantly by a stimulus. Why it is necessary for the stimulus to follow the exact performance which is to be reinforced. In the presence of these stimuli (the food magazine, sound, and light) moving the head down to the feeder put the bird in the front of a hopper of grain so he can eat. In the absence of these stimuli, lowering the head does not have these consequences. When the student can describe these and other similar sequences of performances an stimuli, new verbal stimuli such as "a chain," "conditioned reinforcer" and "discriminative stimulus" are introduced and the existing verbal repertoire is brought under their control by rearrangements appropriate to the concepts. In other words, the direct objective description of the behavioral events in plain English precedes the description of these same events in technical language. Theory is introduced even later, after the student has fluent control of the technical terms. A theoretical article by Skinner (1953) in Chapter 13, for example, was designed as a reinforcer for all of the chapters that preceded. The student could read such a chapter easily and meaningfully because he had already acquired all of the component behaviors from the preceding chapters. The article, which would be very difficult for the beginner, was easy and familiar for a student who had been properly prepared by the preceding text. Such a way of developing abstract thinking is the reverse of the procedure of many texts which state a principle first and then generate a few examples to illustrate it.

Each part of the text was designed to reinforce the behavior developed from the parts that went before. This was done by carrying the repertoire from each chapter forward with increased levels of abstraction and interaction with other terms and concepts. The development of abstract terms in stages, as described above, contributed to the cumulative effect of the text in which the behavior that the student acquired in one chapter or section contributed to or even made possible this behavior in the text. Thus schedules of reinforcement from one chapter is a necessary repertoire for the chapters on stimulus control which describe procedures in which intermittent reinforcement is an important component.

Summary

The course which is described here reverses the usual role of the student and professor. The student, who in the conventional classroom listens to the professor speak, now becomes an active participant who demonstrates the competence he acquires from his study of the course materials. The professor instead of conveying the course content to the student by speaking to him, arranges a verbal environment that recognizes the student's achievement and is reactive to it.

Although it was not necessary to lecture to the students to convey the course content to them, a limited number of lectures proved to be useful as a model of the repertoire that the student is trying to achieve and as a way of exhibiting the professor's style. Experience in this course confirms F. S. Keller's (1968) observation that about four or five lectures of 20-40 minutes each is an optimal amount of exposure of the professor's repertoire. Testing has a role different from the traditional lecture-examination teaching environment. Instead of a small sample of the student's behavior designed to test differences among students, the student's repertoire is examined in detail and depth so that he may go on to a next part of the course when he achieves competence in an earlier part.

An important by-produce of the experimental classroom was the positive identification it encouraged with the professor, the course assistants and the objectives of the instructional system. In such a course, the role of the professor is that of an ally who helps the student to master the content and concepts needed to certify him. Since the criterion for certifying the student involves a single high level of quality it was seldom necessary to take disciplinary action and the occurrence of a low grade was the student's decision not the professor's. Informal contact with the teaching staff also contributed to students' positive identification with the course. Because the professor was not occupied during the class period conveying the content of the course, he was free to casual and informal interaction with the students during class. Many student contacts were with the course assistants but the professor was continuously present and there was ample opportunity for all students to ask questions or to chat informally. As a result there were very few visits to the professor's office despite an open door policy.

FIGURE I

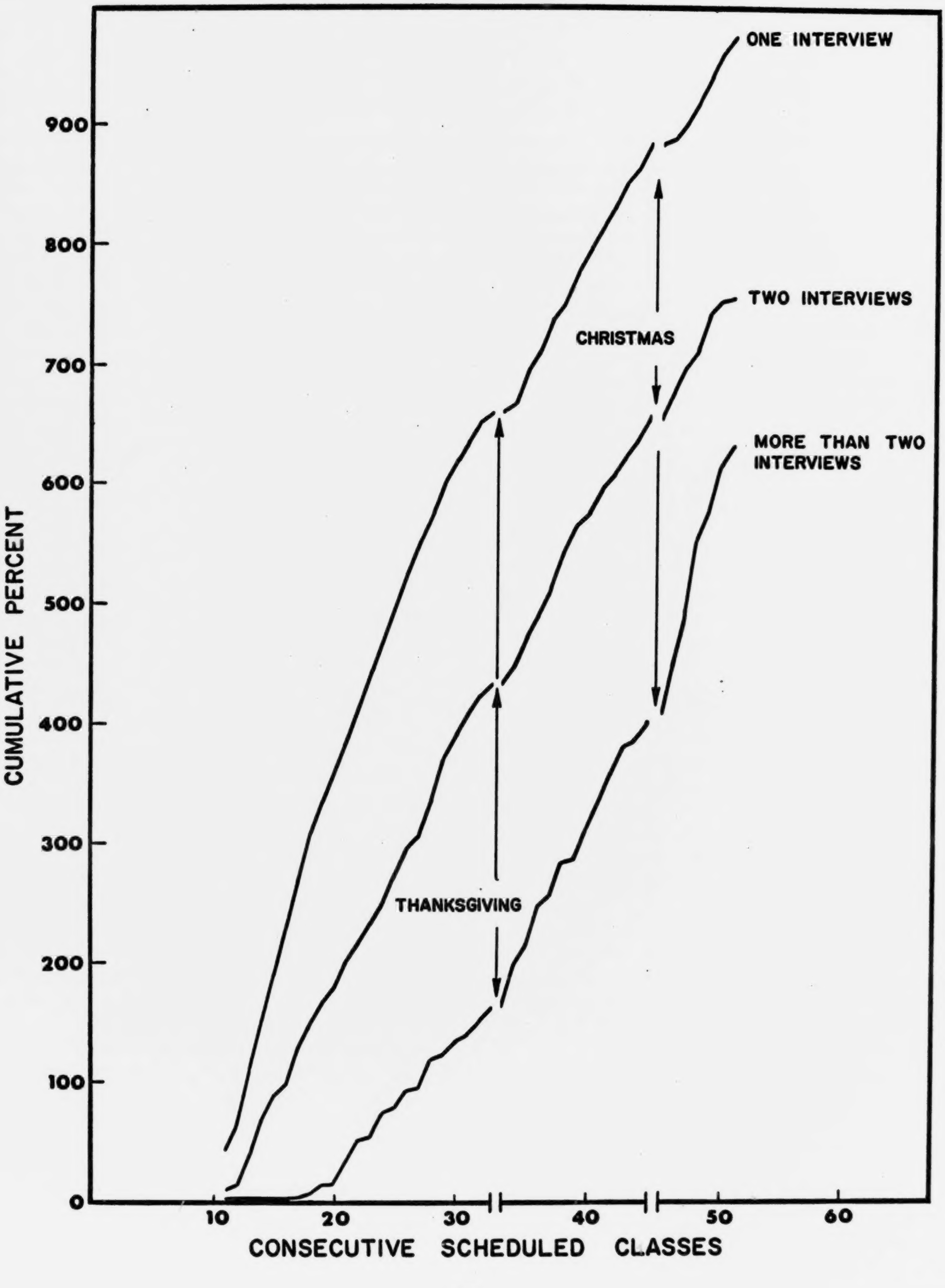

ONE INTERVIEW
TWO INTERVIEWS
MORE THAN TWO INTERVIEWS
CHRISTMAS
THANKSGIVING
CUMULATIVE PERCENT
900
800
700
600
500
400
300
200
100
0
10
20
30
40
50
60
CONSECUTIVE SCHEDULED CLASSES

FIGURE 2

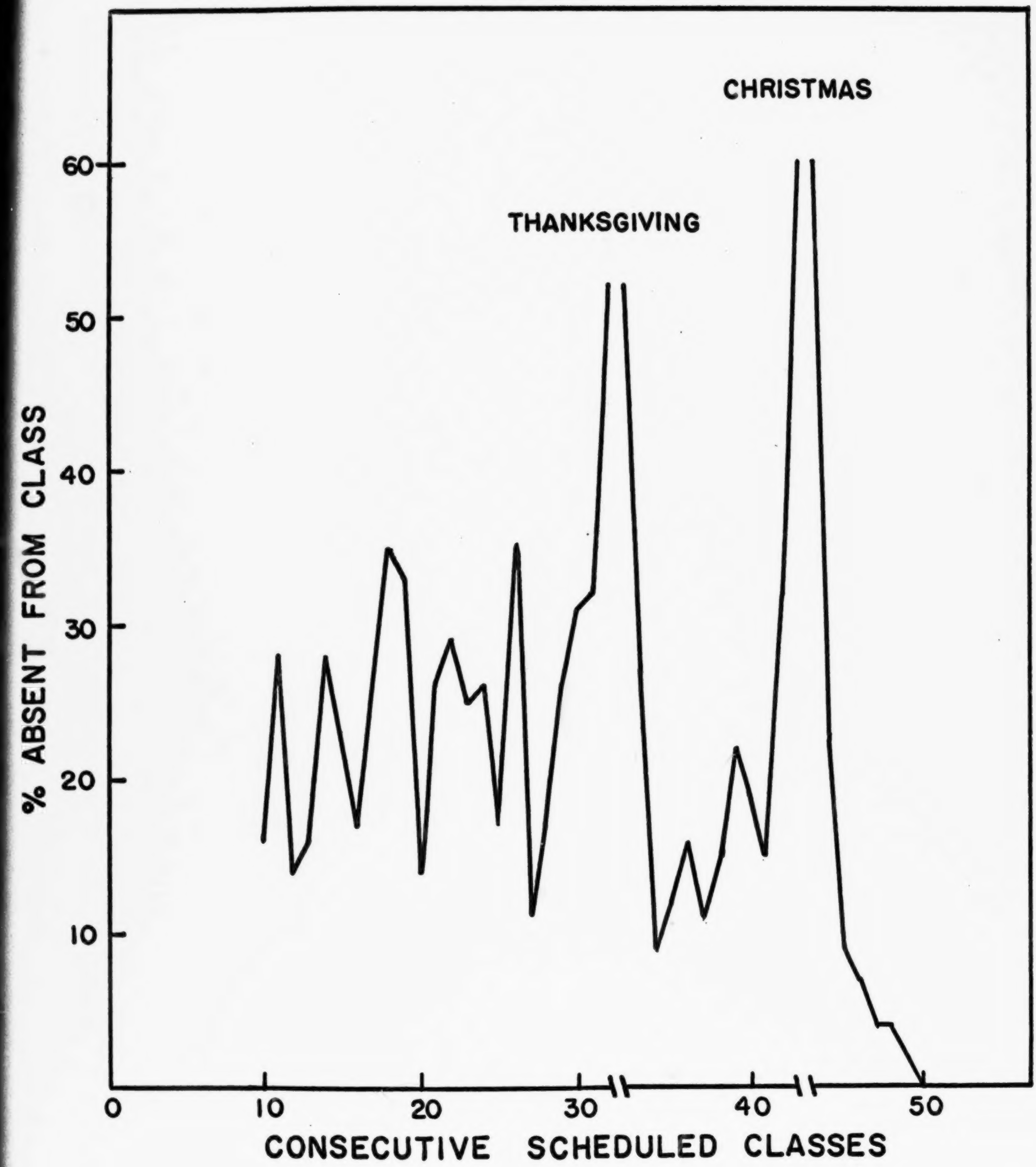

CHRISTMAS
THANKSGIVING
60
50
40
30
20
10
% ABSENT FROM CLASS
0
10
20
30
40
50
CONSECUTIVE SCHEDULED CLASSES

FIGURE 3

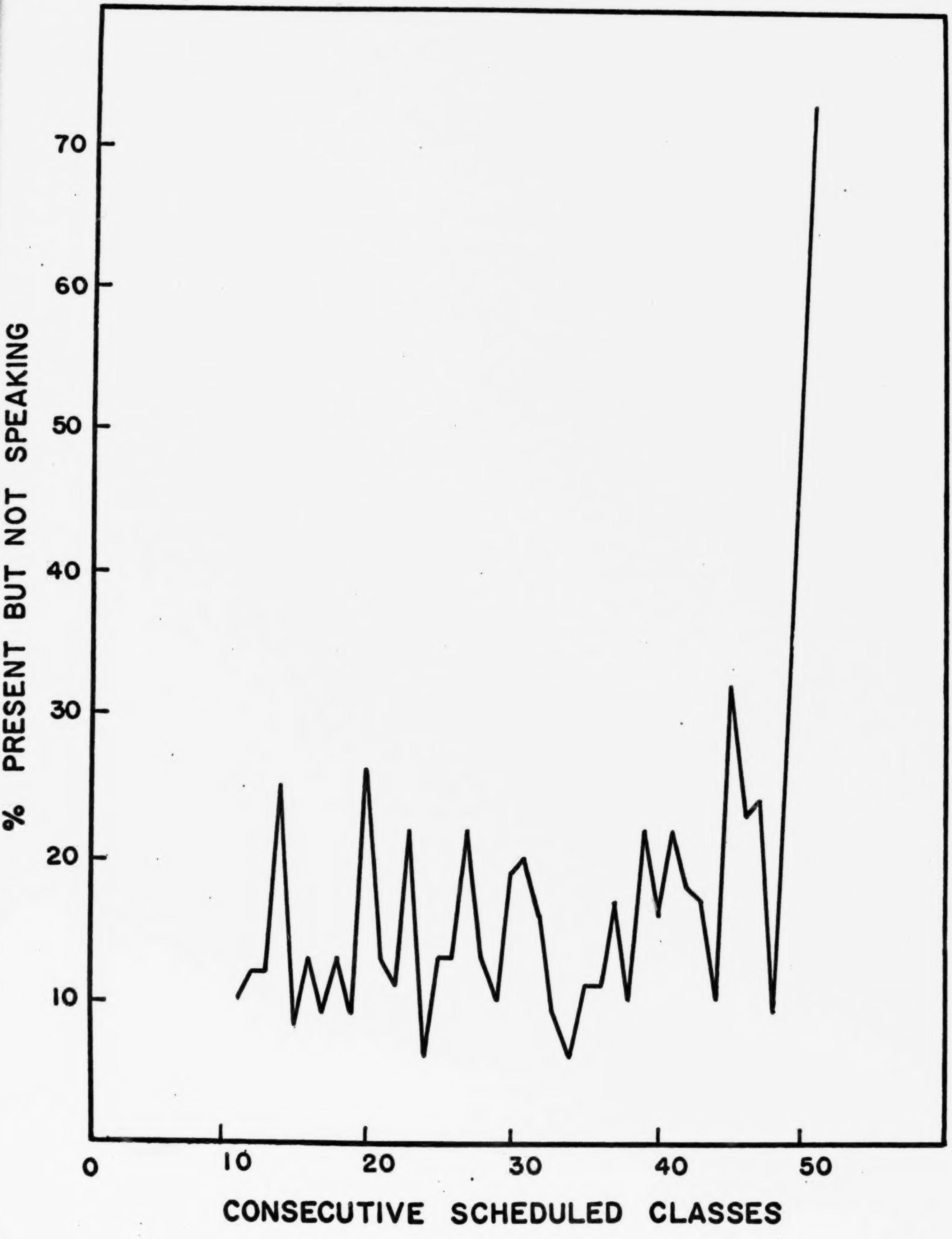
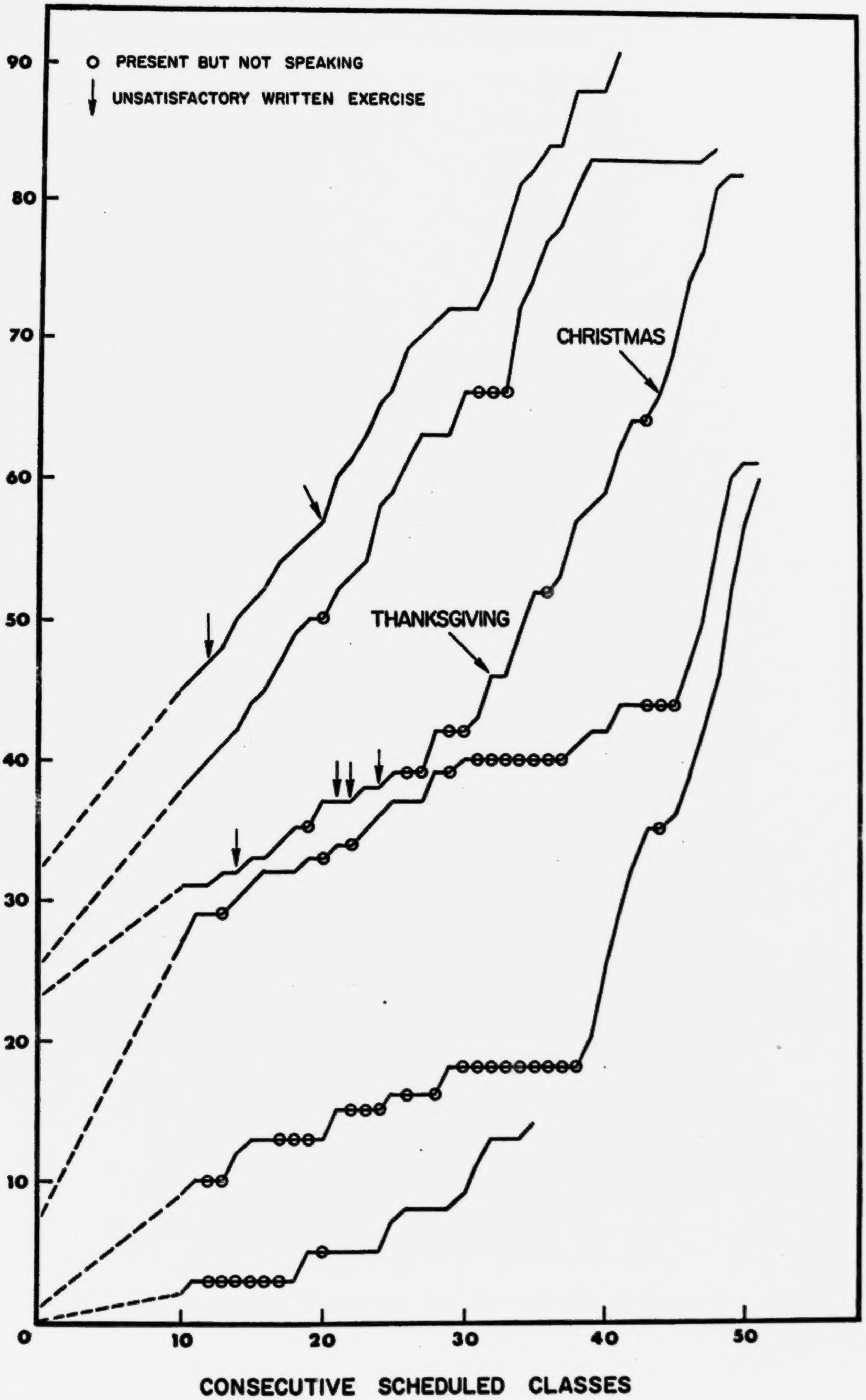

% PRESENT BUT NOT SPEAKING
70
60
50
40
30
20
10
0
10
20
30
40
50
CONSECUTIVE SCHEDULED CLASSES

FIGURE 4


○ PRESENT BUT NOT SPEAKING
↓ UNSATISFACTORY WRITTEN EXERCISE
CHRISTMAS
THANKSGIVING
CUMULATIVE INTERVIEWS
0
10
20
30
40
50
60
70
80
90
10
20
30
40
50
CONSECUTIVE SCHEDULED CLASSES

Chapter 5

A Brief Training Program to Teach Principles of Reinforcement

The training programs, using the interview procedure and Behavior Principles involved considerable investment of the student's time. Further, it was designed primarily for a student with a literacy at approximately the college level. Because some of the clinical staff such as summer counsellors were not employed long enough to justify the time required for a long course and because some of the Linwood staff lacked verbal skill approaching the college level it seemed advisable to experiment with a briefer training program. Such experiments were carried out by F. S. Keller who applied a system of instruction he had developed earlier and devised a course for the summer counsellors at Linwood and a few other selected persons on the Linwood staff.

The following text describes the teaching method, which is applicable in many educational systems beyond a treatment center.

A PERSONALIZED SYSTEM OF INSTRUCTION

Fred S. Keller

Preface and Prerequisites

You begin with discontent. You have shuffled your pack of cards so many tiems that every hand is familiar. You have replaced lectures with demonstrations, demonstrations with discussion, discussion with laboratory, laboratory with demonstrations, and demonstrations with lectures. You have added and subtracted, combined and separated, in every conceivable way. You have used movies, tape-recordings, and closed-circuit television you have changed your textbook every year, or used something else instead. You have even tried teaching machines. You have worked with all types and all frequencies of examination. You have done just about everything, but nothing seems to satisfy, and you are almost ready to give up the game.

You recognize your failure. You see it everywhere, every day, in the performance of your pupils, but your best evidence lies in the distribution of grades at the end of your course. Year after year it is the same. Ten percent of your class, maybe less, finishes the course with the standing you desire for all, and just as large a number fails completely. The students are more carefully selected, better qualified, and with more motivation than ever before, at least when they enter your course. But their grades at the end are distributed throughout the range from excellence to failure, in the standard fashion, with little change throughout the years you have been teaching.

You accept your failure. You have stopped railing against the "system" that blocks you, the "administrative" prohibitions that hem you in, and the impossible goals of "mass education." You no longer attribute your failure to overwork, lack of help, attitude of your superiors, the high priorities of writing and research, or the low estate of teaching.

You are ready to do something positive about your plight.

Introduction

The behavioral requirements of the modern world are becoming more complex. Better education is needed in every sphere of human action, for all peoples, and at every stage of human development. Our old ways are no longer sufficient, and have not been for some time. The pressure upon us to improve matters, in our own land and in our own schools, is mounting daily.

The problem we face will not be solved by increasing the salaries of teachiers, raising the standards of their education, or bearing down upon their pupils. Nor will it be solved by imitating the dubious procedures of a few prestigious institutions,publicizing the methods and achievements of great men from an earlier day, or appealing to Yankee ingenuity in the field of automation or visual aids. These things may all be of value, and all of them have been tried in some degree, but with insufficient gain. We need something more, and the continued existence of our profession may depend upon our finding it.

The program of instruction described in this little book is but one of several that are currently attacking the problem of effective education by applying the concepts of modern learning theory. It is not here offered as the best of all programs. In comparison with what is to come, it may, indeed, be poor. But, present findings suggest that, compared with those programs it was designed to supplant, it merits consideration by teachers in psychology and elsewhere, who seriously desire to improve their efficienty and their status.

This book has two related objectives: to describe a new system of academic instruction and to show how it may be applied to a course of study. Part One deals with the system's principal feature and its general mode of operation. Part Two provides a sample of its application to a small body of psychological material -- a brief introduction to reinforcement theory.

This new way of teaching may be called personalized, programmed, or proctorial, for reasons that will soon become clear. It originated in 1963, as the result of a collaborative effort by two Brazilian and two United States psychologists. It was first tried out with an introductory psychology class at the University of Brasilia in 1964,and, a few months later, at Arizona State University. It has since been adopted at Queens College (N.Y.) and, with minor changes, at several other institutions in this country and in Brazil.

Chapter 5

There are three basic features of the system as outlined in Part One. First, it is a system of individualized instruction. Although tailored to fit within the framework of present-day academic requirements and facilities, it provides much the same opportunity for individual, step-by-step progress through a course of study as does the teaching machine, the programmed text, or the classical tutorial system. Secondly, it is a system that requires complete mastery of course material at every stage of advance, from the course's beginning to its end. And, thirdly, it is a system of personalized instruction, in which the interaction of one student with another (his proctor) is tightly woven into the educational pattern.

The first two of the above-mentioned features, the provision for individualized advance and the requirement of complete mastery at each step, were emphasized in the first Brazilian tryout of the system. The third, which became important at Arizona State in meeting the challenge of larger classes and a shortage of graduate assistant, is, perhaps, the distinctive aspect of the system. It is the feature that takes the student beyond the mere acquisition of a body of knowledge or the development of a skill to an appreciation of these activities as socially desirable and worthy of emulation.

The sample program of study presented in Part Two is a modification of one that was constructed in 1966 for use at the Linwood Children's Center, in Ellicott City, Maryland, in connection with a grant from the Division of Handicapped Children and Youth, of the United States Office of Education. That program aimed to acquaint members of the Center's summer staff (high-school students,mainly) with the basic concepts of reinforcement theory; and its reading assignments were drawn from two principal sources: Holland and Skinner's The Analysis of Behavior and Keller's Learning (Reinforcement Theory). The present program, an abbreviation of the Linwood version, is intended simply as an example of the way in which assignments, study questions, tests, and the like, may be employed within a personalized system; and it is based exclusively on the revised edition of Learning (Reinforcement Theory).

It was noted above that this system of instruction was first designed for the teaching of a beginner's course in psychology and has thus far been used mainly within this area. There is no reason to believe, however, if the basic procedure is sound, that it could not be applied in other disciplines and at other levels of instruction. Indeed, the interest already shown by teachers throughout the country, from grade school to graduate school, and in such diverse fields as those of mathematics, sociology, and English grammer, suggests that such may be the case.

Chapter 5

Part One: Essentials of the System

Preliminary

A programmed course starts out, like any other, with the selection of materials to be learned. There may be a textbook (or two), a list of readings, a set of experimental exercises, or all of these in combination. The choice is more difficult than in conventional courses because of the demand for mastery that the instructor intends to impose upon his pupils. The text, for example, must be read with great care to determine the adequacy of its coverage and the clarity with which it is written. The content may, of course, be supplemented, and not all of it may be used, but trouble will arise if students are asked to learn material that is obviously too complex or is obscure to the instructor himself.

Once decided on, the material of the course must be broken down into work units. These units are roughly comparable to home-work assignments in a conventional lecture course. Their number will depend on several factors, and adjustments may be necessary in meeting local conditions, but the issue will not be hard to resolve. Twenty units have, in the past, been adequate for a one-semester course in elementary psychology, of fiftene or sixteen weeks' duration. Fewer might have served -- for example, one for each week of the term -- or, for students with poor records of achievement, a larger number might have had more appeal.

In order to compare student achievements numerically at successive stages of the course it would seem that the work units should be as nearly equal as possible in ease of comprehension. This may be hard to achieve, however, in the first term of their use, and is probably undesirable, especially at the beginning. One of two relatively easy units will get students off to a good start, just as an over-difficult one will hurt class morale. It is even possible that very weak students might profit from unit subdivisions until they gain confidence and the power to meet "normal" requirements. In any case, of course, unit difficulty is measured by student reaction, and surprises may await the instructor of a programmed course in his first tryout of the method.

For each unit, there should be prepared a list of study questions, sufficient in scope and number to embrace all the items of fact or theory that the instructor feels the student should learn from the assignment. These questions will eliminate most of the worry shown by students when they ask their instructor what he thinks is important in their reading. To simplify the student's task, it is advisable to present the questions in the order of their coverage in his text.

A student in a programmed course moves on to each new unit of work only when he has passed a test on the unit or units that preceded.

Since his performance must be 'perfect,' he may have to take more than one test before he demonstrates his readiness to go ahead. The instructor must therefore construct a number of tests on each assignment of the course. Experience suggests that more than four will rarely be needed, but each must be different from the others and as representative as possible of all the assigned material. The length of the test and the form of its questions will depend upon various factors to be treated later on in this account.

The analysis of textbook material and the preparation of tests and study questions need not be carried to completion prior to the launching of a programmed course. No more than a beginning is really required or even desirable. Neither unit size nor number may be correctly estimated in advance. Study questions and readiness tests need only be written to serve the lead-off students of the course, who will commonly require no more than a single test to show their grasp of the assignment. Clearly, the experienced teacher will have an advantage in the selection of units and the preparation of questions, but a great deal of cutting and trying may still be necessary. Flexibility is a prime requisite in the first semester's run of a programmed course.

It goes without saying that a staff must be secured and classroom space must be reserved before the course can start. The services of proctors and assistants must be enlisted and places must be set aside for study, testing, and grading, as well as lectures, movies, and demonstration. But these matters can best be discussed after the procedures of the course have been described.

Basic Operations

The system of personalized instruction within a conventional academic framework normally begins when the student arrives at his first class meeting. It is there that he will be introduced to his teaching staff, will receive his first assignment, and will learn the modus operandi of his course -- by word of mouth or, preferably, in a typed or printed form that he may study at his leisure.

The assignment, for this and for later units, may simply comprise a specified number of pages in the textbook for the course but it could also include materials of a different sort -- a relevant article or an essay, an excerpt from some classic study, or even materials prepared by the instructor himself.

With this unit assignment, of course, will come the student's study questions, with hints on how to use them. Their number will vary with the amount of their generality and the type of reading they cover, but they are designed, as noted above, to touch upon every point that the instructor thinks is essential (and, perhaps, to exclude some items that he deems to be of lesser merit).

Chapter 5

In the description of course procedure that the student receives along with his first assignment, he will be told the steps to take from that point on. First, he is to study his assignment until it is mastered -- until he is sure that he can cope successfully with all the study questions of that unit. This work may be done at home or in the classroom (which will serve mainly as a study-hall throughout the term), but the latter is recommended as preferable. Others will be studying there and someone will always be on hand to help him if he has trouble with any part of his assignment. In addition, the study hall will be the common source of class announcements, some of which may be of interest or importance to him.

Secondly, when ready for testing on his knowledge of the unit, he is to go to his study-hall proctor, who will send him immediately to be tested or ask him to wait until a testing space is open. The testing may be done in a separate room, where there is certain to be quiet, or in the study-hall itself -- say, in the front row of seats or in the rear, under the eye of a testing proctor. The number of students to be tested at one time will depend upon the current availability of proctors for grading. A pile-up of students waiting to be graded is less desirable than a pile-up to be tested.

When he reaches the testing proctor, he will receive one of the forms of the test on the work unit he has studied, along with a standard examination booklet on one or two pages of which he is to write his answers to the test questions. (When several students are being tested on the same unit at the same time, the testing proctor takes care to provide each one with a different test form.) As soon as the questions are answered, say in ten or fifteen minutes, he is to return the test form to the proctor in charge. The latter will then record the student's name, together with the form of the test given, after which he will send him, with his answer booklet, to the proctors' room for grading. (Optimally, the route from testing room to proctors' room is short and public, in order to discourage any tendency of the student to verify his answers with outside help before reaching his proctor.) At one of the desks in the proctors' room, perhaps in a special cubicle, he will find the proctor to whom he has already been assigned for the duration of the course and to whom he will always report except on those occasions when a substitute is necessary, as when the proctor is taking his turn in testing room or study hall.

The next step in procedure is of great importance. The proctor, with the student seated beside him, will grade the student's readiness test. Initially, all incorrect answers will be checked off with a pen. If there are too many of these (say, four or more), the grading operation will be concluded at that point and the student will simply be advised to study further before taking another test. However, if very few errors occur(say, three or less), the student will be permitted to defend his answers. If the defense is impressive and a restatement of the questions evokes satisfactory replies, the proctor may indicate a change in his grading by placing an "O.K." beside each of his earlier check-marks. In the event of an inadequate defense, the proctor will discuss the matter with the student, recommend re-study of the appropriate part or parts of the reading assignment, and send him away with the assurance that his failure will not be held against him, either then or in the future. In case all the answers merit an "O.K." or are initially correct, the proctor will congratulate the student, record the success, and give the student his next assignment. At this point, the cycle of study, testing, and grading begins again, for the next unit of course material. The test booklet is left with the proctor, to be passed along to the assistant or the instructor at the end of the period, for purposes of inspection and recording.

The student is advised that, after failure on one test, he will not be able to take another until a certain period of time has elapsed. The length of this interval will depend somewhat upon the number of test periods available per week, but it should probably never be less than thirty minutes.

The student is also told to expect comprehensive review testing at regular times, say after every five units of study. These review tests are treated in the same manner as those for the individual units, with advance contingent upon the same high level of performance as before. The most extensive of the review tests, of course, is the final examination, which provides a sampling of every unit, and which may not permit individualized grading or re-take possibilities.

The Role of Lecture and Demonstration

"The lectures and demonstrations in this course will have a different relation to the rest of your work than is usually the rule. They will be provided only when you have shown your readiness to appreciate them; no examination will be based upon them; and you need not attend them if you do not wish. When a certain percentage of the class has reached a certain point in the course, a lecture or demonstration will be available at a stated time, but it will not be compulsory."

The above quotation is from the foreward to a personalized course in psychology given at Arizona State University in 1966-67. It suggests the relatively minor role which is assigned to the classical lecture or demonstration within a programmed system of instruction. The purpose of these and related devices (movies, field trips, etc.) is primarily motivational. They are not central to the basic educational process, and they could be eliminated entirely without doing serious damage, but they are not without some value. They permit an instructor to appear at his inspirational best before an unusually receptive and well-prepared audience to whom he can speak about some favorite topic, some newly discovered fact, some experiment in which he is engaged, or almost anything else he wishes, without feeling that he should be doing something more useful or significant. Also, they permit the students to see their instructor in action, to sample his style and get the flavor of his thought, under the best of circumstances. No threat of future quizzing hangs over their heads, nothing important rides upon their failure to catch every detail of his message, and no struggle with note-taking distracts their attention from the flow of the instructor's thinking or the sequence of events in the 'show' before them.

By ordinary standards, lectures, demonstrations, and the like within a programmed course are short in duration (twenty minutes, in the course mentioned above) and few in number (eight were given during the semester). These values, however, will depend upon the hours allocated to other, more important, aspects of the course. If a lecture or a demonstration, no matter how interesting, competes with an opportunity to pass a test, or even to prepare for one in study-hall, it will attract only a handful of those students who have earned the right to attend, and even these may not repeat. If announced in advance, it may encourage a flurry of test-taking, to qualify for an event which may then be ignored. By increasing the available hours per week for testing and grading, by placing a ban upon test-taking while the speech, or its equivalent, is in progress, and by making each performance as rewarding as possible, an instructor may come to draw a modest crowd. In the process, however, he is likely to conclude that other features of his course are much more important, and that the lure of the lecture is vastly over-rated.

Grades and their Distribution

Current practice in most educational institutions calls for the grading of student performance in terms of a series of letters or numbers. Until such ratings are replaced by something more descriptive of a student's actual knowledge or skills, practical considerations suggest that any new system of instruction should try to maintain contact with this conventional grading procedure, unless, that is, the old and the new systems are obviously incompatible in this respect.

Ideally, in a well-programmed course, every student should come out with an A, or its numerical equivalent.[1] If he has passed all his unit tests, as well as his reviews, and if the final examination covers the same course material, even asks some of the same questions with which he has already dealt successfully, there is no reason to rate him less than "perfect."

In practice, however, this ideal may not be fully realized. Suppose that, after masting each unit of a twenty-unit course, a student answers only seventy percent of the questions on his final examination correctly. His instructor may not want to give him a course grade of A, especially when some of his classmates have obtained perfect or near-perfect scores on the same examination. A grade of B is the likely result, based upon the instructor's arbitrary weighting of the contributions made by unit mastery and final examination to the total grade. (In one of the courses from which grade data is presented below, the students were advised, at the outset, that the final examination would carry twenty-five percent of the course grade; in another course, the value was thirty percent. The effect of different weightings upon the proctor-student relationship is presently unknown, but probably important.)

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[1] Which suggests that letters and numbers could then be abandoned.

A grade other than A may also be given when a student fails to complete his course units within the time normally required for this purpose. In the absence of complicating factors, an Incomplete would then be the logical rating, and the student would be permitted to continue his work during the following term. Or the student and the instructor might agree upon an alternative grade, based on the number of units actually completed, together with the student's performance on the final examination. Thus, in a twenty-unit course, eighteen completed units might be treated as a B-plus performance, to be combined with whatever score the student earned on the comprehensive final examination.

As a result of these considerations -- grade on the final examination, difficulty with successive steps throughout the course, or time-out from the course during the term -- there is commonly a distribution of grades in a personalized course, rather than a single category, A. Figure 1 is based upon data from a class of 94 students at Arizona State University in the Winter Term of 1966-7. In this course, Withdrawals were possible for some time after the course began (even encouraged, because of excessive enrollment) and the rating of Incomplete was easily obtained. (About half of these Incompletes were removed during the following term.)

Figure 2 represents the grade distribution for the Spring Term of 1966-7 at the same institution. Withdrawal was not encouraged, hence an increase in the number of course failures (F's); and Incompletes were possible only after a review, by the instructional staff, of each individual petition. There were 208 students in this course.

Figure 3 is based upon data from Queens College of the University of the City of New York. Essentially the same course material was covered and the same quality of performance demanded as in the Arizona State classes, but no Incompletes were used and the category of failure (F) includes some cases that would ordinarily be counted as withdrawals. In level of achievement, this class is perhaps the best of any that has yet been taught by the present system.

Chapter 5

A Word about the Incomplete

The Incomplete is conventionally a grade that makes it possible for a student to extend the period of time normally required for the completion of a course and the assignment of a letter grade. Its use is commonly restricted, in the interests of academic record-keeping and the discouragement of a lackadaisical attitude among students toward their work. In a programmed course, however, such restriction is hardly in accord with the promise to a student that he may progress at his "own pace." He may go as fast as he likes, but not as slowly, even though he may be given an increased number of hours per day or week in which to be tested and graded.

There are many reasons why a student's work in any course of study may be interrupted or slowed down. Illness has traditionally been a good one, and "outside work" in the interests of self-support has been grudgingly accepted on occasion. But there are others that deserve to be recognized by an educational institution that pretends to awareness of the individual needs of its students or which sponsors activities that conflict with full-time devotion to the scholarly ideal. Extra-curricular activities, of one kind or another -- glee club, dramatics, publications, athletics, recognized social functions, even the demands of married life and other personal-social relationships -- ought not to jeopardize the grades of all but a favored few.

In a programmed system of instruction, many of these slow-downs and interruptions may be offset by a little extra effort when the critical period has passed, but some of them may leave the student in arrears when the term comes to its end. He must then settle for a final grade that represents neither his ability nor his motivation; or he must be given an Incomplete. Until the day when letter or number grades are no longer employed and when a course of study is terminated whenever the requirements are met (whether early or late), the grade of Incomplete would appear to have value. Properly administered, it need not be abused, and the book-keeping problems it may generate will not be serious.

(A problem related to course termination is that of course beginning. Our present-day academic structure asks students to line up together at the same starting point to await the same starting gun. In a programmed system of instruction, wherein each student goes at his own pace, with no premium placed upon group activity or group assembly, there is little reason to select one time for starting a course in preference to another. More latitude in this respect might also permit instructors to free themselves of the rigid requirement that all courses be of the same duration, or a multiple thereof; and it might even be advantageous administratively, in avoiding peak pressures of registration and record keeping.)

Chapter 5

The Proctor and his Function

A personalized system of instruction is a closely interlocking system. It is one of "mutual reinforcement," in which each participant's rewards (or punishments) are derived from the work of the others; and it is one in which the activities of each participant produce the task for the next. The student provides the work for the proctor; the proctor and the student give the assistant his data; the assistant reports to the instructor; and the instructor starts the cycle all over again with an assignment for the student.

The proctor, however, is the new link in the causal chain, the new addition to the familiar classroom scene. Hence, he is the focus of critical attention, even of suspicion. Who is he? Where does he come from? Why is he here? What are his rewards? And how long is his term of duty? These are common questions about the proctor and his place within a programmed system.

First of all, the proctor is a student, one who has already passed successfully through the course in question and who is preferably a "major" in the general area represented. He is selected by the instructor simply because he is interested in the topic, has the hours free in which to serve, and is willing to do so. He does not have to be a grade-A student in his other courses, and his mastery of his major field may not greatly exceed that of the students he will serve.

The proctor's job is that of decreasing the gap of understanding between student and instructor -- a gap that is wider than many teachers realize. He is able to do this because he possesses a repertory of behavior that is intermediate between the two in dealing with the subject matter of the course. Thus, he may find, in a student's "wrong" answer to a question, a logic that the instructor would never have perceived; he may restate a "misunderstood" question in a way that brings out a student's true knowledge of the subject; he may strengthen, by way of example or of parallel statement, the student's grasp of a concept; and he may provide the instructor with the kind of feedback from the student that will ultimately improve the communication between them.

The proctor is not a "teacher" or a "coach," in the usual sense of these terms. He should not give lectures (he has neither the time nor the skill therefor) and he should not drill his students in "the one right answer" (the "same" questions and the "same" answers may vary greatly in their form). But he checks routinely on those test responses that clearly hit, or miss, the target; he raises objections to other answers, and he evaluates their defense -- an evaluation that may in turn be evaluated by the assistant or the instructor; he directs his "proctee" to further study in some area of the text that was assigned, or advises him to consult another member of the staff; he clarifies briefly those matters on which he is well informed; and, more generally, he engineers his proctee's learning in every way he can, by guidance, counsel, and encouragement, without fuss, or fuming, or pedantic display.

Several factors aid the proctor in the performance of such duties. (1) He has his own experience with a similar course, in which he has already been successful, and the problems of his proctee were recently his own. (2) He has already considered, in a weekly proctors' meeting for this purpose, every question on each test that he will have to grade. (3) He has available, for immediate reference if he needs it, a list of acceptable "answers" to each test question, often coupled with a discussion of some of the points involved. Such a list may be very helpful when many different units are covered within a single working hour. (4) And, finally, since the proctor has generally taken advanced courses within the same subject-matter field, there is the additional factor of relevant knowledge from "outside," which may occasionally be put to use.

The proctor's rewards are many. There is the recognition he receives from the assistant, the instructor, and other faculty members; the respect he is given by his family or his friends; the satisfaction that he derives from his own improved knowledge ("You really learn what you have to explain"); and the points of academic credit that may be added to his record. (In the course mentioned earlier, the proctors were given two points of credit for service that included a weekly two-hour meeting with the instructor, about four hours a week of proctoring duty, and whatever extra "home work" was required). To these rewards may be added those involved in the daily exercise of his functions -- the attention, the respect, the expressions of gratitude that he receives from his proctees, by virtue of his position in the chain of getting-ahead activities.

The role of the proctor in a programmed system is vital and, in many respects, to be envied. As an advanced student, perhaps an upperclassman, he enjoys a status, both academic and social, which is denied to graduate students and faculty members. It is easy for him to be the kindly, understanding big brother, whose good will is much desired, whose advice is seriously taken, and whose word can be law. With every test that he prepares to grade, with every discussion of its answers, his own knowledge is strengthened, and his counsel is made more effective. He cannot be blamed by the student for difficult assignments or badly-constructed tests; he simply helps repair the damage that they may have done. If he is severe in grading, it is for his proctee's own good, either in later tests or on the final examination. And he is curbed from over-leniency, not only by the assistant or instructor, but by the awareness that his own status depends finally upon the success of his charges. A better method of teacher training is hard to imagine.

In a 1965 poll of student reaction to a personalized course in elementary psychology, it was disclosed that ninety percent of the class favored the use of proctors in the giving,[2] grading, and discussion of tests. It was also shown that ninety-four percent of the group felt that their discussions were educationally beneficial. Such expressions of opinion suggest, but do not prove, that the student-proctor relation was actually of value in speeding their progress through the course or in raising their final examination grade. A recent study, however, at Queens College, by Professor John Farmer and associates, gives support to the conclusion that student-proctor interaction is quantitatively related to one of these variables. Their data show that the greater the percentage of course units discussed by the student with his proctor the lower the number of tests required to pass each unit in a twenty-unit course. (The evidence is also clear that this speed-up was not accompanied by a worsened performance on the final examination) The relevant data from this study are presented in Figure 4.

Study-Hall and Test-Room Duty

Important to the smooth operation of a personalized course is someone to whom students may turn for help while working on their unit assignments in the study hall. The instructor or the assistant will occasionally serve this function in their visits to the area, but it is advisable to have someone on hand at all times, to confer with students over difficult text material -- unfamiliar terms, obscure passages, unintelligible references, poorly labelled figures, and so on. Such is the role of the *study-hall proctor*, who may also have charge of distributing course hand-outs (assignments sheets, study questions, etc.), announcing lectures and demonstrations, and regulating the flow of students to the testing room.

The work load of the study-hall proctor as a consultant will depend on several factors -- the adequacy with which reading assignments have been selected and study questions have been prepared; the type of help that the proctor provides and the manner in which he does it; even the willingness of students to be seen asking for help. In general, however, his burden will not be irksome. He will serve a small percentage of the class, usually the weakest ones, and he will seldom be submerged by requests for aid once the course is under way and the students have gained in self-reliance. Collaboration in study, as between friends who may be working on the same unit, will also reduce the demands upon the study-hall proctor.

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[2] The *giving* of tests by proctors was later discontinued because the time required for writing test answers was considerably greater than that required for grading. Use of a special "testing proctor" made it possible for the grading proctors to serve many more students within a class hour.

The study-hall proctor may be chosen from the proctors' pool because of his course history, academic status, or special aptitude that recommends him for the task. Or he may simply be drawn from the larger group in a regular rotation of study-hall duty regardless of any special qualifications he may seem to possess. The former procedure might seem to be preferable and possibly is, but there is currently a lack of data for making a decision. The student who "acts like a teacher" in his tendency to talk, to clarify, even "to help," is not necessarily the most effective promotor of learning, in the classroom or elsewhere.

The study-hall proctor stands between the textbook and the student in somewhat the manner that the grading proctor stands between the student and the instructor. His task is also educational. The testing proctor, however, is not a proctor at all, in the sense of furthering instruction. He hands out tests and blue-books, seats students in appropriate places, collects the tests when the questions have been answered, records each event, and sends the students with their blue-books to the proctors'room for grading. His work could be done by any reliable clerk with a grade-school education, and obviously does not merit points of academic credit. Yet he is an essential cog in the course machinery. For this reasons, under the system currently in effect, grading proctors take their turn as testing proctors in regular rotation, each carrying a small portion of this non-instructional load. A change in course logistics, or the employment of special personnel, might easily relieve proctors from this chore.

Length of Service, Number of Proctors, and Related Matters

For how many terms should a student serve as proctor in a programmed course? No more than two, in a one-term course, and preferably one, although any answer to this question must be arbitrary. It is true that students may be needed for a second term under some circumstances -- for example, during a period of growing registration in the course, when the supply of new proctors may be insufficient. It is also true that some proctors may not have attained their greatest skill by the end of their first tour of duty, and that there is a certain value in having a few 'old' proctors on the staff when a course gets under way, especially to look after "Incompletes" from the preceding term. But there are negative factors that must also be considered -- diminishing returns in what a proctor learns from his work, a decreased appreciation of his proctee's problems, and an increased tendency to deliver lectures or engage in disputation. The best solution to this problem may be one or two well-chosen exceptions to the general rule of one-term proctor service.

How many students should each proctor have in a programmed system of instruction? Here, too, there is little fact on which to base a decision. Limited experience suggests that in a standard, three-credit college course, with testing and grading permitted on three to five days of the week, for a total of six hours, the student-proctor ratio should not be greater than ten to one. With as many as a hundred students in a course, there should be twelve to fifteen proctors. One of the group will be routinely assigned to study-hall duty and another to the testing room, in addition to which still others may be needed to replace absentees. (A student who wishes to be graded in the absence of his own proctor may be sent by the assistant to a substitute who happens to be free.)

The number of students that one proctor may look after within a standard class hour will obviously depend on numerous factors. Besides the proctor's own pace and style of working, there will be the special needs of the student tested; one man may regularly require a few minutes only, whereas another may consume as much time as permitted. There will be the length of the readiness test to be covered, the range of coverage, and the type of questions asked (true-false, completion, short-essay, and so on). And there will be seasonal fluctuations in the number of students seeking to be tested. One day of the week may be consistently favored over another; heavy attendance may be expected following tests in other courses (to make up for time taken out in cramming for such tests); and there may be an especially great demand for proctors during the final weeks of the term.

The problems raised by such factors are not as serious as the above enumeration may suggest. Some of them may be avoided entirely, and adjustments may easily be made to others on a day-to-day or week-to-week basis. They do suggest, however, the kind of managerial questions that come up within a programmed course and the kind of vigilance required for its smooth, efficient operation.

With respect to the number of proctors per assistant (or per instructor), a ten-to-one ratio is also desirable, but for different reasons. The main issue here is the assistant's need for an intimate, detailed acquaintance with the work of each proctor in relation to the goals of the course. The assistant's period of interaction with the proctors, outside of their regular periods of duty, is limited to a weekly two-hour session. At this meeting, announcements must be made, unfamiliar course materials may have to be introduced and sometimes clarified, errors in assignments, in test questions, and in proctors' grading must be corrected or discussed, and, especially, opportunity must be given to each individual proctor for questioning course procedures, raising problems, suggesting changes, reporting incidents, or expressing himself in any other relevant fashion. The greater the number of proctors in this group, the less contact the assistant (or the instructor) will have with each one and the less the efficiency of the system as a whole. Beyond twelve, or fifteen at the most, the number of proctors becomes too great to meet the requirements of educational control.

With restriction in the number of proctors per assistant, it becomes apparent that the maximal size of a class that one assistant can effectively manage should not greatly exceed one hundred. If larger numbers are to be served, it can only be through the addition of new assistants, each of whom has his own course unit. At this point, there are two main possibilities. (1) The assistant may be given primary control of his own course, except for the selection of study material and the preparation of tests. He takes charge of lectures, demonstrations, proctors' meetings, and final grading of students, in the manner of an instructor. (2) The assistant is given no additional responsibility or control, but the instructor attempts to increase the number of "sections" in his course, adding new assistants as he adds to the number of proctors, and continuing to carry out as many as possible of his earlier course functions.

The first of the above alternatives is preferable when the assistant has graduate-school status and understands fully the aims and the machinery of the course. If he himself is given an assistant, or even a well-qualified proctor, to carry out certain routine functions, his contact with proctors and students may be just as effective as that of an instructor or professor. The second possibility, that of increasing the number of assistants without giving them charge of their own courses, is less desirable. Even two or three assistants cannot be added in this way without reducing greatly the intimacy and the efficiency of the instructor's relation to his proctors and his students.

(If the above discussions seems to weaken the case for a programmed system of instruction because it sets a limit to the size of the class that an instructor may effectively teach, the problem of large numbers should perhaps be re-examined. A long-term view might suggest that this issue would look after itself if students were individually trained in an adequate manner. A student who has successfully completed a programmed course is far more able to assist in the instruction of another than is commonly the rule; a proctor, with a single term's duty behind, him, is even better qualified; and a trained assistant, especially a graduate "teaching assistant," may operate as effectively, in all important respects, as a senior professor. The answer to the large-number question may lie, not in bigger auditoriums or televised lectures, but in an increased supply of qualified teachers.)

The Assistant and His Duties

So much has already been said or implied about the duties of the assistant in a programmed course that little remains for mention here. It should be obvious that his role is subject to great variation. In the early phases of a course, when the instructor is developing his materials and his techniques, the assistant may be little more than an errand boy or clerk. If the class is small, his work could be done by the proctors, or by a paid undergraduate. The instructor is then monitoring all operations closely, visiting the study-hall and the test room, conferring with the proctors, checking blue-books, talking with students, and so on -- all in addition to those duties that are peculiarly his own.

Once the course is under way, however, the assistant's daily tasks would normally include (1) the distribution of assignment sheets, study questions, blue-books, test-forms, and special readings to the appropriate proctors at the appropriate times and places; (2) the collection of blue-books after grading, and the recording of units passed or failed; (3) regulation of student flow between study-hall, testing room, and grading center; (4) assignment of students to substitute proctors in the absence of their own; (5) allocation of clerical work and checking of supplies; (6) maintenance of progress charts, both for students and for the instructor's information; and (7) general aid to the instructor at proctors' meetings, in course demonstrations, and through private reports on the status of the course.

Especially important among the assistant's duties is the record-keeping function mentioned above. Professor J. G. Sherman, after four years of teaching a programmed course at Arizona State University, argues that "it is nearly impossible to over-estimate the importance and usefulness of a good recording system." To this he adds: "We now have a filing folder for each student, in which all his tests are kept. On the inside cover is a summary sheet which at a glance tells you the date, the [test] form, the sequence of forms [for each unit], and the proctor who graded each test (see sample below). The quick retrieval of the student's history, the pace he has kept, where he paused, how many forms of the various unit-tests he took, which proctors know him best, etc.," are all made possible by this record, which Professor Sherman describes as "about the most useful thing we have ever done."[1]

	I				II			
UNIT	Form	Date	Proctor	P or T*	Form	Date	Proctor	P or T
1	A	3/12	Brown	T	B	3/14	Smith	P
2	C	3/17	Brown	P				
3								

* P = Pass, T - Try

Finally, when the course is fully organized and running smoothly, a good assistant may take on even more of its basic operations. Given some clerical aid of his own, he may preside at proctors' meetings, evaluate proctors' ratings, prepare his own demonstration, or give an occasional lecture. He may assume, gradually, so much control of the course that he is practically indistinguishable from "the teacher." This is probably as it should be, in terms of his own growth and the instructor's need for time in which to make desirable changes in the content or procedures of the course; but it should never be permitted without the assistant's full appreciation of the system of mutual rewards upon which the success of the course depends. The classic role of the assistant as a boss or martinet is clearly out of place within a programmed course.

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[1] Personal communication.

Responsibilities of the Instructor

"The instructor will have as his principal responsibilities: (a) the selection of all study material used in the course; (b) the organization and the mode of presenting this material; (c) the construction of tests and examinations; and (d) the final evaluation of each student's progress. It will be his duty, also, to provide lectures, demonstrations, and discussion opportunities for all students who have earned the privilege; to act as a clearing-house for requests and complaints; and to arbitrate in any case of disagreement between students and proctors or assistants..."

The most important of the instructor's functions listed above are those which deal with the selection and analysis of material to be learned, its mode of presentation to the student, and the construction of various questions based upon it. These are functions that the instructor alone is really qualified to exercise, and they are especially critical in a programmed course.

The textbook, for example, must be carefully read before it is selected, to determine its suitability for students who will be questioned in detail on its content and who will be given the opportunity to defend their answers. Errors, confusions, and contradictions that would commonly go unnoticed or unremarked within a conventional system of instruction may stand out as unsightly blemishes in a programmed-course assignment. Study questions must skirt around them, proctors must be schooled to deal with them, test questions must take them into account, and supplementary material may have to be written to avoid the damage they might do.

The breakdown of text material into study units is also a task of some magnitude. The textbook chapters may or may not be of suitable size. Their complete mastery has probably never before been required, and the amount of material assigned may have less than a perfect relation to the amount that a student learns. The difficulty of a unit can only be estimated roughly in advance of an actual tryout, and the instructor in a programmed course is likely to find that his early assignments are not as easy as he thought, even for his better students.

In writing study questions, the instructor must avoid the extremes of over-generality and over-specificity. If his questions are too detailed, they may delay the student's grasp of major concepts and broad principles -- he will not see the wood for the trees. If they are too general, they will foster confusion in the student, and they will restrict the number and variety of later *test* questions that the instructor will be able to base upon them.

(Study questions help the inexperienced or inefficient reader to do what the well-trained reader can do for himself, and they are probably more important at the beginning than at the end of a programmed course. It is possible that they could be systematically eliminated in successive units of the course, in a way that would bring the study habits of the initially inferior student to a comparable level with that of the initially superior.)

Test questions are harder to compose than study questions and they are far more important. Ideally, the test forms for each study unit should be clearly different from each other, but should sample all the basic material of the assignment. The questions should minimize the role of guessing and they should be suitable for proctors' grading, without restricting the student to "the right answer" on which he might conceivably be drilled. Wherever possible, they should also encourage concept formation, thinking, and reference to affairs that lie beyond the purely academic.

Currently, in programmed courses, each unit is sampled in a series of questions that may be answered by filling in a word or words, marking a statement as true or false, or selecting one of several alternative answers. Proctors generally prefer the fill-in type of answer to grade, even when the amount of fill-in approximates a sentence. Fill-in answers, unlike the true-false type, provide a record that may point up sources of misunderstanding, is more easily evaluated by assistant and instructor, and is less likely to engender argument between a student and his proctor.

A short-essay question may profitably be asked in addition to the smaller, more easily graded items of a test. The answer may tell a great deal about the student's control of the subject matter and may set the stage for lively discussion. It also permits the assistant or the instructor to interact with the student by means of written comment, question, or criticism. As in conventionally taught courses, the grading of answers to such questions may be difficult, and the "correctness" of the answers should probably not be given too much importance in evaluating unit mastery. Their principal virtues may lie in the opportunity they provide for the student to express himself and for the instructor to give encouragement and guidance. Indirectly, the instructor's comments may also have value for the proctor.

The length of a test will depend on the number and kind of questions asked, which may vary in turn with the time available for testing, the size of the unit assignments, and the student-proctor ratio. In a 20-unit course, with four or five testing periods per week, and a ten-to-one student-proctor ratio about ten well-chosen fill-in questions and one short essay has been adequate, but no general prescription can be offered at this time.

The teacher of a programmed course is fortunate in having detailed feedback on all the questions he constructs for tapping the student's knowledge. In addition to every written response, he has at least one other person's reaction to it. An answer that he might summarily dismiss as wrong may be given considerable acceptability when translated by the proctor, who can often see a source of misunderstanding to which the instructor is blind. Some questions will, as a result, have to be re-written or discarded; others will occasion a revision of the study questions or a supplementation of the reading assignment. A few "bad" questions may not be without value. They encourage useful discussion and sometimes sharpen the concepts involved. Too many of them, however, can only weaken the student's regard for his textbook or respect for his teacher.

Supplementation of inadequate study materials, if on a large-enough scale, can be of value to the instructor in more than one way. It may save trouble in the construction of test questions, as suggested above. Also, it gives the instructor a chance to develop original assignments, testing out their adequacy for his students under optimal conditions. Gradually, unit by unit, he may write his own book, as part of his routine daily function, rather than on occasions that might better be devoted to research or recreation.

An optional task for the instructor, comparable to that of providing demonstrations or lectures at given stages of the course, is that of selecting or preparing short articles, essays, sketches, and the like as free "hand-outs" for his students. Such material should be intrinsically interesting, relevant to the student's background of facts, and given as a "reward" for passing certain unit tests. Its primary aim should be inspirational, not educational.

Epilogue

We all know that this is a time of great concern for the future of American education. Eminent critics have dramatically described the deplorable features of the present scene and offered their own prescriptions for improvement. They have invited us to raise the status of the teacher in society, to enhance the quality of training within our teachers colleges, to put more pressure upon our students, and to make more use of the marvels of modern industrial arts. Rarely has it been suggested, however, that our basic teaching procedure should be drastically overhauled in the light of what we know about the learning process.

Chapter 5

The system of instruction described in the preceding pages is intended to be a step in the direction of such a behavioral technology. It is not the only system currently being developed, not is it in its final form. But it is an actual, workable system, and it has been described here in enough detail to be of value to anyone who is interested in trying it out.

Possible improvements in the system will have suggested themselves to the readers of the foregoing account. There is hardly an area in which some change cannot be made, probably to good advantage. It should be noted, however, by those who would make such changes, that the system is an interlocking one, in which the functioning of each part depends on the functioning of the others -- in which a change in one area may have effects, either good or bad, in others. Especially sensitive in this respect are those aspects of the system which mark it as distinctive.

There is, first, the go-at-your-own-pace feature, which permits the student to pass through the course at his own speed, without penalty for being too fast or too slow, or for stopping along the way. The teacher who places a restriction upon this feature returns in some measure to conventional procedures and must be prepared for negative repercussions.

Secondly, there is the demand for unit perfection as the basic condition of advance. Perfection is a relative term, but its value for the student should not be under-estimated. To accept even a ninety-percent criterion (or its letter equivalent) is to return to a numerical rating that is meaningless in describing what a student does or does not know. Not all A-students are alike in their potentiality, but they are alike in the requirements they have satisfied, and that is the only realistic meaning which can be given to the grade.

Thirdly, there is the use of proctors, which permits immediate scoring and repeated testing, which facilitates student-instructor communication, and which enhances the personal-social aspect of the educational process. The day will come, perhaps, when effective interpersonal relationships may be generated with the aid of the computer or the teaching machine. Until then, the proctor, despite his human weaknesses, may simulate this function. His replacement, whole or partial, should be made with great caution.

Fourthly, there is the use of lectures and demonstrations as motivational devices, rather than sources of information. The tendency today is strong within most teachers to give speeches which students are compelled to attend and upon which they will be examined. The role of the teacher is, historically (and unfortunately), that of the talker; and when he comes to direct a programmed course he may find it hard to resist his old behavior patterns. They should, however, be resisted, or given very limited opportunity for expression.

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Generally speaking, no change should be introduced within the system without considering the influence it may have upon everyone involved. It is not enough to think only of the student's welfare; the proctor, the assistant, and the instructor must also be considered, if their optimal interaction is to be maintained. What is meat for one must not be poison for another.

Fortunately, the system is internally strong and not easily upset in its equilibrium. Minor ill effects of change will show themselves to an alert instructor well in advance of any serious damage. They will come from the assistant's daily reports to the instructor, the weekly proctors' meetings, blue-book comments by the students, or from all of these sources; and they will probably suggest their own remedy.

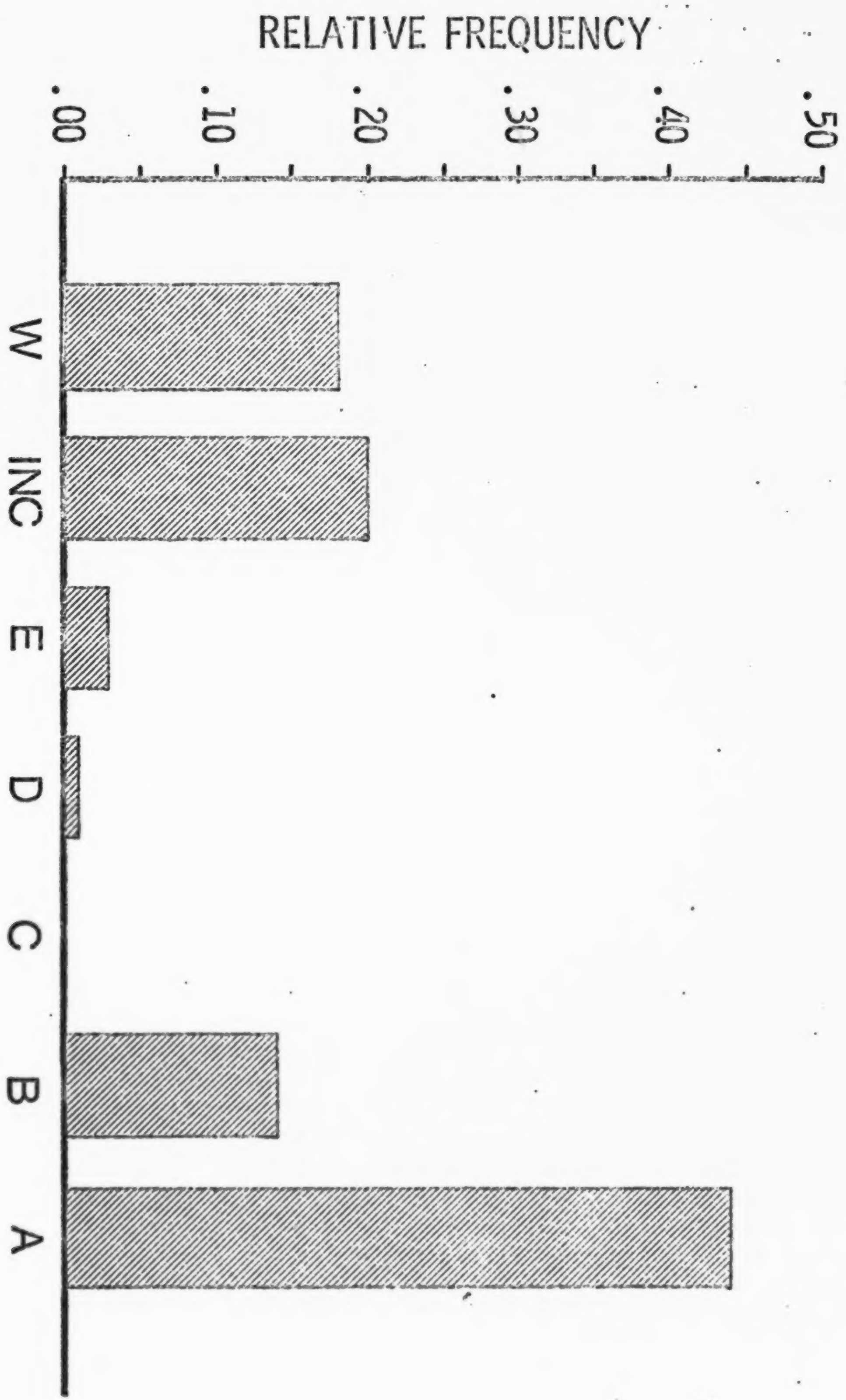

Figure 1

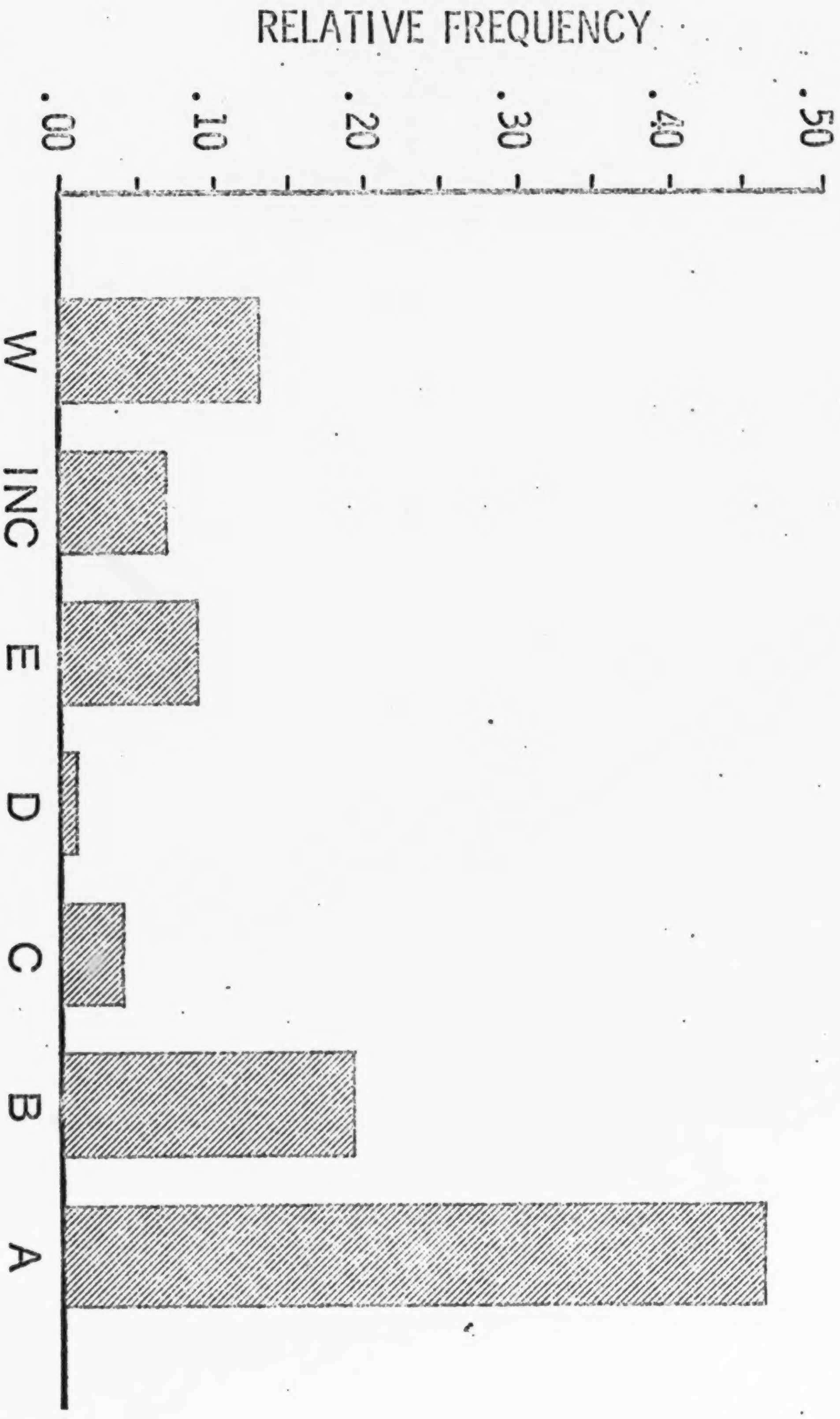

Figure 2

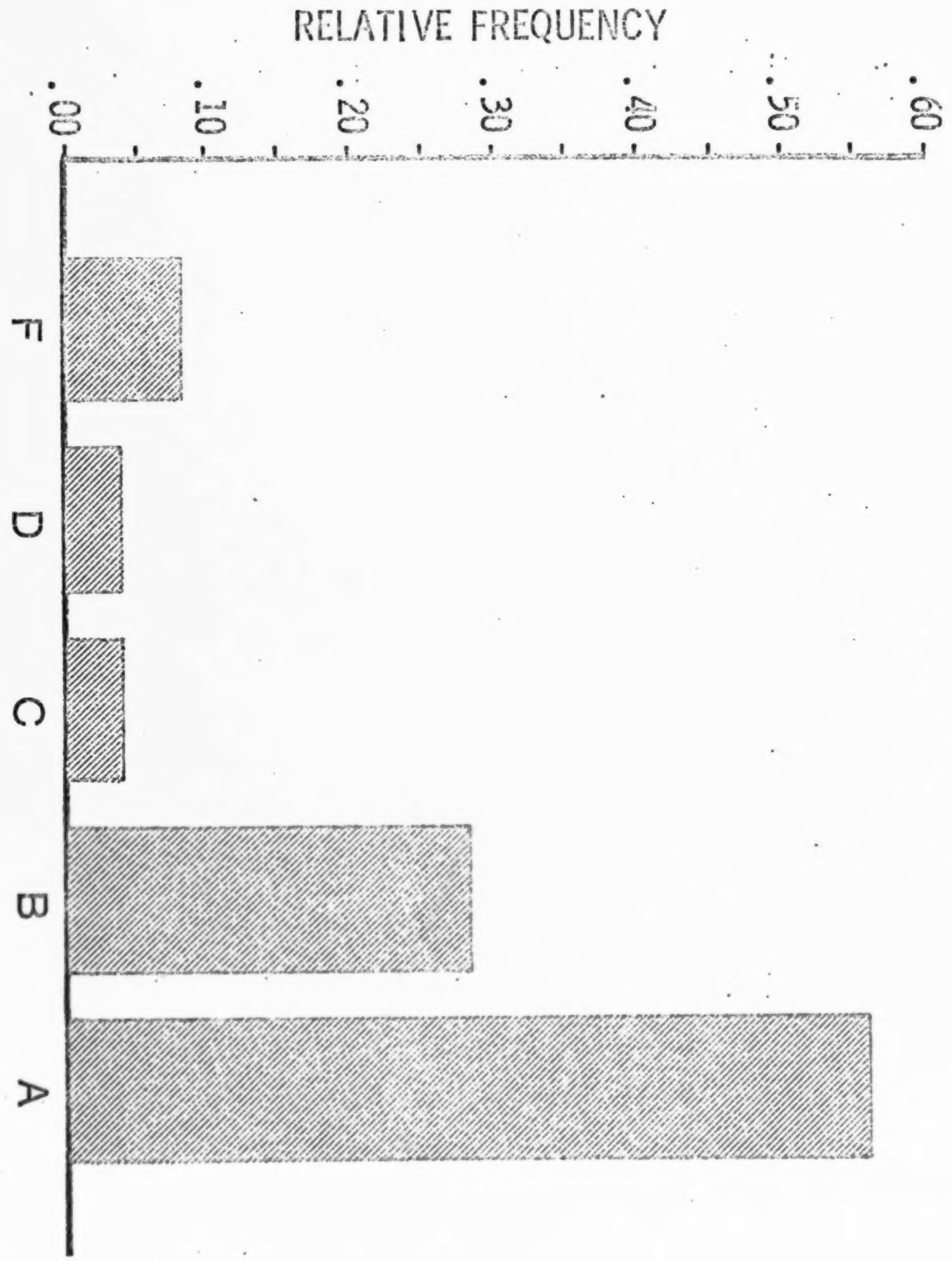

Figure 3

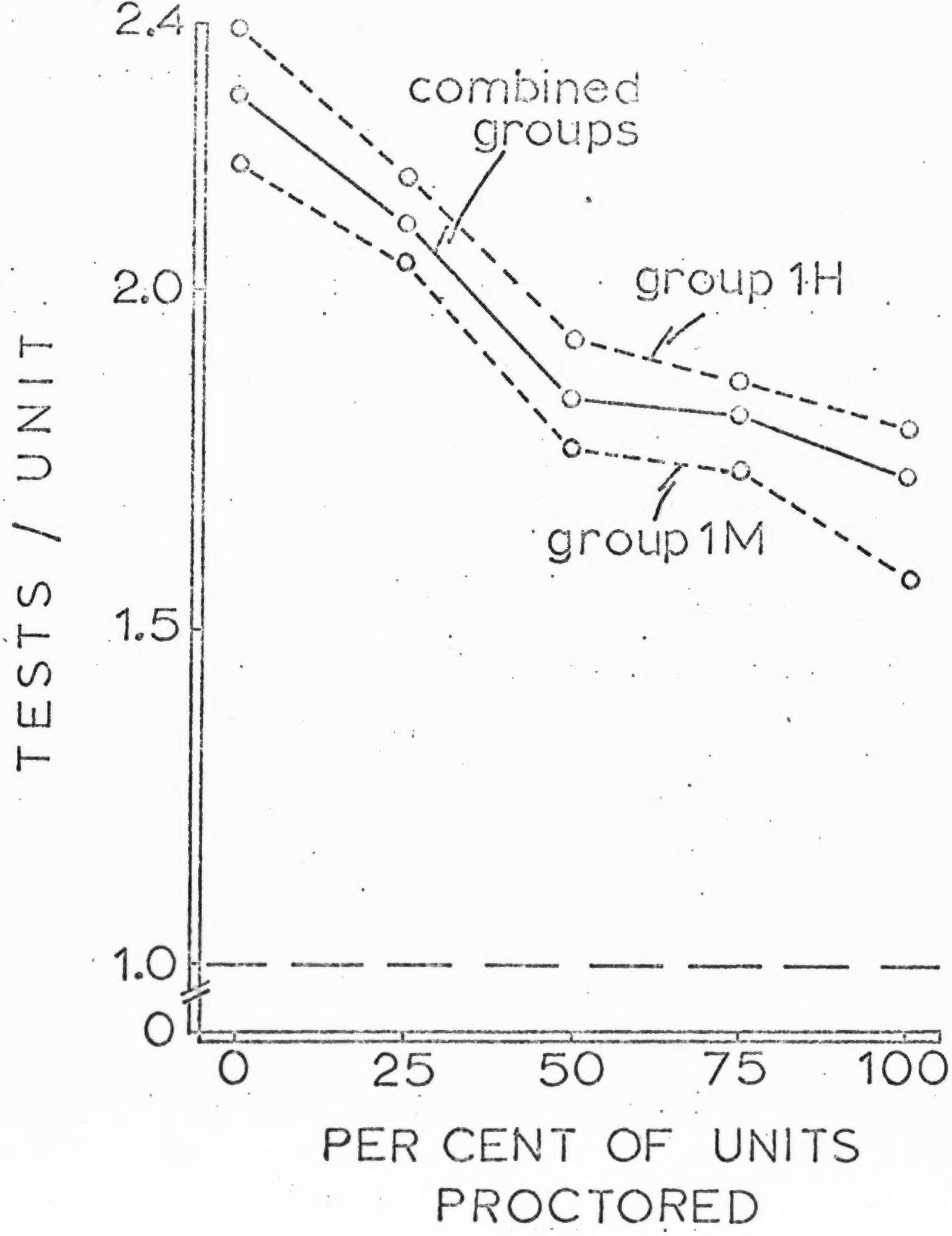

Figure 4: Mean number of tests taken per unit passed is shown as a function of the percentage of units proctored. Data for groups 1H and 1M are shown separately, and represent different introductory psychology classes. Different proctors were used in the two groups. The combined function is the average of the two groups.

Chapter 5

A COMPACT COURSE IN THE PRINCIPLES OF BEHAVIOR

by

F. S. Keller

Introduction

This is a course that aims to teach you some fundamental principles of human behavior. A knowledge of these principles should help you to talk about behavior more easily and more usefully than you have done before; it should help you to see behavior more clearly and objectively; and it could even lead you to work with behavior more effectively, in your home, at school, or in whatever occupation you may be employed.

You can go through this course, from start to finish, at your own speed. You will not be held back by other students or compelled to go ahead before you are ready. You may complete the course in a few days, perhaps, or you may take several weeks. We do not care how fast you go; we just want you to do your job well.

The course is composed of ten parts, or units, which are to be studied in numerical order, from one to ten. When Unit 1 has been mastered, you will move on to Unit 2; when 2 is mastered, you will go to 3; and so on, until the course is completed. You can show that you are prepared to move from one unit to the next by passing a "readiness test" which shows your grasp of the material already studied -- that you are "ready" to go ahead. This test will be provided for you by your proctor, and passing it will depend on your perfect performance. If you should fail on one or more of the tests that have been prepared for each unit, no harm will be done. We really do not expect that you will pass the first test on every unit, and failure only means that you will be asked to study some more and try again.

Readiness tests will be given on certain days of each week, at hours to be arranged. Two tests on the same unit of work may be taken on the same day if the testing times are separated by a study period of at least 30 minutes. Two different units may be tested in rapid succession if you pass the first test and feel ready for the next.

A few short lectures, demonstrations, discussions, or movies will be provided during the course, at times to be announced. No test questions will be based on these events, and attendance is not compulsory, but you may find them rewarding in one way or another if you care to join us.

When you have passed the readiness tests for all ten of the course units, you will take a final examination based upon the entire course. The questions for this examination will be drawn primarily from the readiness tests you have already passed, and your examination score will account for only 25 percent of your course grade. Unless you are very careless in reviewing, you ought there to receive the final grade of A. (Or an Incomplete, in case you do not finish the units before the end of the term.)

The teaching staff for your course includes a proctor, an assistant, and an instructor. The proctor has been chosen for his acquaintance with the contents of the course, for his understanding of the special problems that confront you as a beginner, and for his willingness to help. He will provide you with some of your study materials and he will pass upon your readiness tests as satisfactory or unsatisfactory. His judgment will ordinarily be law, but if he is ever in serious doubt he can appeal to the assistant or the instructor for a ruling.

The assistant has charge of the assignment sheets, study questions, special readings, and other course materials. He (or she) collects and keeps up to date all progress records for all course members. He confers with the instructor regularly; he advises the proctor, and may aid him on occasion; and acts in various other ways to keep the course machinery running smoothly.

The instructor's principal responsibilities are to select all study materials for the course; to analyze these materials into work units; to prepare study questions for each unit; to construct tests for each unit; to provide lectures, demonstrations, and discussion opportunities; to act as a clearinghouse for requests and complaints; and to arbitrate in any case of disagreement and misunderstanding between students and staff.

Only one text will be used in the course. This is a pamphlet entitled Learning: Reinforcement Theory, written by F. S. Keller and published by Random House (1968), rev. ed.

This is enough of an introduction for now. Other suggests, instructions, and advice will be provided at your first meeting with the teaching staff, or will be given to you later.

Unit 1: Operant (Voluntary) and Respondent (Reflex) Behavior

Your reading assignment for this unit:
Sections 1 and 2 of Learning: Reinforcement Theory.

This is a small assignment but it is a basic one and it will provide an introduction to the procedures of your course. To deal with it most effectively, it might be a good idea at first to read the two Sections through quickly to get the main ideas. Then, perhaps, you should turn to the list of study questions and go through the assignment again, seeking out the answers and writing them down carefully so that you may use them later in reviewing for your final examination.

When you have satisfied yourself that you know everything in the assignment, you should take your first readiness test. The questions on this test will be different from your study questions, but they will cover the same ground and should give you no trouble. In any case, don't worry about the outcome. Failure on this test means only that you will be given a chance to take a second one after a little more study; and failing a second test means only that you take a third; and so on. Each test, with its related preparation, will tighten your grasp on the course material and make your final examination that much easier.

Your study questions for this unit:

1. Several examples of learning are suggested in this assignment; can you add five more from your own experience?
2. What does your text say about the definition of learning?
3. Why is the situation hopeful in psychology with respect to this problem of learning?
4. What are the two broad classes of behavior that are discussed in your text? Why are their older names unsatisfactory?
5. What is the outstanding feature of respondent behavior? Can you give one example of this feature in addition to those mentioned in your text?
6. What is the outstanding feature of operant behavior? Can you give five examples in addition to those which are mentioned in your text?
7. A man is overheard talking "to himself." Was the behavior operant or respondent? Why? Can you think of another example of behavior that you might classify in the same way for the same reason?
8. How do operants differ from respondents in their connection with stimuli?
9. Are respondents always connected with stimuli? Are operants? What specific stimuli cause the operant responses of early infancy?

A FAMOUS NAME:

Rene Descartes (1596-1650), a French philosopher, mathematician, and student of human nature, was one of the first persons to describe the reflex and offer an explanation of the way in which stimuli elicited responses. Also, he recognized dimly the difference between respondent (reflex) behavior and operant (voluntary) behavior. For these and other contributions, he is often called the Father of Modern Psychology.

Chapter 5

SOMETHING TO THINK ABOUT:

A reflex is treated in Unit 1 as a connection or relation between a stimulus and a response. What would a conditioned reflex be? What would an unconditioned reflex be? You'll find the answers in Unit 2.

Unit 2: Respondent Conditioning (the Conditioned Reflex)

Your reading assignment:
(a) Section 3 of Learning: Reinforcement Theory.
(b) Conditioned Emotional Reactions, by Watson & Watson
(see below)

This assignment introduces a very important principle, that of the conditioned reflex. This principle was brought to the attention of biological science at the beginning of this century by the great Russian Physiologist, I. P. Pavlov (see below, under Famous Names). It is especially concerned with emotional behavior, as Watson and Watson recognized in their study of "little Albert," which makes up the second part of your assignment.

The experimental procedure used by Pavlov is called conditioning, but psychologists sometimes say Pavlovian conditioning, classical conditioning, or (as we do here) respondent conditioning. This is done in order to distinguish it from another, even more important, type of conditioning, which you will deal with in Unit 3 and later.

In studying this assignment, you should read your text material before going to the experiment by Watson and Watson. In this way you will be better able to understand what they really achieved.

Your study questions:
(for Learning: Reinforcement Theory)

1. Can you identify the neutral and the eliciting stimuli in each of the three cases of conditioning mentioned at the beginning of your assignment? What were the related conditioned responses?

2. In what way were the three experimental procedures alike in the above-mentioned examples?

3. In what order and by how much time should the stimuli follow each other for most successful conditioning? For least successful?

4. Besides order of stimulation and time between stimuli, what other conditions might affect the speed of conditioning?

5. Why should one be cautious about calling a stimulus "neutral"?

6. How many reflexes might be said to exist in a conditioning experiment when it begins? When it ends?

7. Can you sketch a conditioning diagram like that on page 5 of your text to illustrate Cases I and III at the beginning of the assignment?

8. In the human salivary experiment (Case II), which stimulus-response relation is conditioned? Which relation is unconditioned?

9. Which stimulus, conditioned or unconditioned, did Pavlov call the "reinforcing" stimulus? Why?

10. To what general class of behavior does Pavlov's principle most obviously apply? To what class does it probably not apply? What did Pavlov himself think about this?

(For Conditioned Emotional Reactions)

1. What were the four questions asked by Watson and Watson in their experiment with the child, Albert? Which of them did they answer in your assigned reading?

2. What changes in Albert's behavior did Watson and Watson observe which made them think that "emotional reactions" could be conditioned? Did they measure any of these reactions?

3. What was the conditioned stimulus in the Watson-Watson study? The unconditioned stimulus?

4. Was there an unconditioned "fear" shown by Albert before the conditioning procedure was begun? What was it? (Be careful!)

FAMOUS NAMES:

Ivan Petrovich Pavlov (1849-1936), the celebrated Russian physiologist, whose studies of digestion in dogs won him the Nobel Prize in 1904, is important to psychology for his discovery and extension of the conditioned-reflex principle. Over a period of nearly forty years, Pavlov and his pupils sought to clarify the functions of the brain in animals and human beings. In so doing, they gave to psychology many facts about behavior, tied together in a way that served as a model for much of present-day "reinforcement theory," and making him a psychologist by adoption!

John Broadus Watson (1878-1958) received his principal training in psychology at the University of Chicago. Later he taught at Johns Hopkins University and, finally, he entered the advertising business. He is famous for originating the behavioristic school of psychology in the United States; for trying to apply Pavlov's principle in accounting for all learned behavior; for emphasizing learning rather than heredity in explaining human conduct; and for his studies of reflexes and emotions in infants. Modern psychological science owes a great deal to Watson's pioneering efforts.

SOMETHING TO THINK ABOUT:

You now know the way in which Watson tested for a "transfer" of conditioned emotional reactions in little Albert, and you know the results he got. How could Pavlov have studied the "transfer" of conditioned salivary response in his dogs, and with what results?

"Conditioned Emotional Reactions"

"In recent literature various speculations have been entered into concerning the possibility of conditioning various types of emotional response, but direct experimental evidence in support of such a view has been lacking. If the theory advanced by Watson and Morgan to the effect that in infancy the original emotional reaction patterns are few is correct, then there must be some simple method by means of which the range of stimuli which can call out these emotions and their compounds is greatly increased. Otherwise, complexity in adult response could not be accounted for. These authors without adequate experimental evidence advanced the view that this range was increased by means of conditioned reflex factory. It was suggested that the early home life of the child furnishes a laboratory situation for establishing conditioned emotional responses. The present authors have recently put the whole matter to experimental test.

"Experimental work has been done so far on only one child, Albert B. The infant was reared almost from birth in a hospital environment; his mother was a wet nurse in the Harriet Lane Home for Invalid Children. Albert's life was normal: he was healthy from birth and one of the best developed youngsters ever brought to the hospital, weighing twenty-one pounds at nine months of age. He was on the whole stolid and unemotional His stability was one of the principal reasons for using him as a subject in this test. We felt that we could do him relatively little harm by carrying out such experiments as those outlined below.

"At approximately nine months of age we ran him through the emotional tests that have become a part of our regular routine in determining whether fear reactions can be called out by other stimuli than sharp noises and the sudden removal of support. In brief, the infant was confronted suddenly and for the first time successively with a white rat, a rabbit, a dog, a monkey, with masks with and without hair, cotton wool, burning newspapers, etc. A permanent record of Albert's reactions to these objects and situations has been preserved in a motion picture study. Manipulation was the most usual reaction called out.

At no time did this infant ever show fear in any situation. These experimental records were confirmed by the casual observations of the mother and hospital attendants. No one had ever seen him in a state of fear and rage. The infant practically never cried.

"Up to appxoimately nine months of age we had not tested him with loud sounds. The test to determine whether a fear reaction could be called out by a loud sound was made when he was eight months, twenty-six days of age. The sound was that made by striking a hammer upon a suspended steel bar four feet in length and three-fourths of an inch in diameter. The laboratory notes are as follows:

> "One of the two experimenters caused the child to turn its head and fixate her moving hand; the other, stationed back of the child, struck the steel bar a sharp blow. The child started violently, his breathing was checked and the arms were raised in a characteristic manner. On the second stimulation the same thing occurred, and in addition the lips began to pucker and tremble. On the third stimulation the child broke into a sudden crying fit. This is the first time an emotional situation in the laboratory has produced any fear or even crying in Albert.

"The sound stimulus, thus, at nine months of age, gives us the means of testing several important factors. (1) Can we condition fear of an animal, e.g., a white rat, by visually presenting it and simultaneously striking a steel bar? (2) If such a conditioned emotional response can be established, will there be a transfer to other animals or other objects? (3) What is the effect of time upon such conditioned emotional responses? (4) If after a reasonable period such emotional responses have not died out, what laboratory methods can be devised for their removal?

"(1) The establishment of conditioned emotional responses. At first there was considerable hesitation on our part in making the attempt to set up fear reactions experimentally. A certain responsibility attaches to such a procedure. We decided finally to make the attempt, comforting ourselves by the reflection that such attachments would arise anyway as soon as the child left the sheltered environment of the nursery for the rough and tumble of the home. We did not begin this work until Albert was eleven months, three days of age. Before attempting to set up a conditioned response we, as before, put him through all the regular emotional tests. Not the slightest sign of a fear response was obtained in any situation.

"The steps taken to condition emotional responses are shown in our laboratory notes.

"11 Months 3 Days"

"1. White rat suddenly taken from the basket and presented to Albert. He began to reach for rat with left hand. Just as his hand touched the animal the bar was struck immediately behind his head. The infant jumped violently and fell forward, burying his face in the mattress. He did not cry, however.

"2. Just as the right hand touched the rat the bar was again struck. Again the infant jumped violently, fell forward and began to whimper.

"In order not to disturb the child too seriously no further tests were given for one week.

"11 Months 10 Days"

"1. Rat presented suddenly without sound. There was steady fixation but no tendency at first to reach for it. The rat was then placed nearer, whereupon, tentative reaching movements began with the right hand. When the rat nosed the infant's left hand, the hand was immediately withdrawn. He started to reach for the head of the animal with the forefinger of the left hand, but withdrew it suddenly before contact. It is thus seen that the two joint stimulations given the previous week were not without effect. He was tested with his blocks immediately afterwards to see if they shared in the process of conditioning. He began immediately to pick them up, dropping them, pounding them, etc. In the remainder of the tests the blocks were given frequently to quiet him and to test his general emotional state. They were always removed from sight when the process of conditioning was under way.

"2. Joint stimulation with rat and sound. Started, then fell over immediately to right side. No crying.

"3. Joint stimulation. Fell to right side and rested upon hands, with head turned away from rat. No crying.

"4. Joint stimulation. Same reaction.

"5. Rat suddenly presented alone. Puckered face, whimpered and withdrew body sharply to the left.

"6. Joint stimulation. Fell over immediately to right side and began to whimper.

"7. Joint stimulation. Started violently and cried, but did not fall over.

"8. Rat alone. The instant the rat was shown the baby began to cry. Almost instantly he turned sharply to the left, fell over on left side, raised himself on all fours and began to crawl away so rapidly that he was caught with difficulty before reaching the edge of the table.

"This was as convincing a case of a completely conditioned fear reaction as could have been theoretically pictured. In all, seven joint stimulations were given to bring about the complete reaction. It is not unlikely had the sound been of greater intensity or of a more complex clang character that the number of joint stimulations might have been materially reduced. Experiments designed to define the nature of the sounds that will serve best as emotional stimuli are under way.

"(2) When a conditioned emotional response has been established for one object, is there a transfer? Five days later Albert was again brought back into the laboratory and tested as follows:

"11 Months 15 Days"

"1. Tested first with blocks. He reached readily for them, playing with them as usual. This shows that there has been no general transfer to the room, table, blocks, etc.

"2. Rat alone. Whimpered immediately, withdraw right hand and turned head and trunk away.

"3. Blocks again offered. Played readily with them, smiling and gurgling.

"4. Rat alone. Leaned over to the left side as far away from the rat as possible, then fell over, getting up on all fours and scurrying away as rapidly as possible.

"5. Blocks again offered. Reached immediately for them, smiling and laughing as before.

"The preliminary tests above show that the conditioned response to the rat had carried over completely for the five days in which no tests were given. The question as to whether or not there is a transfer was next taken up.

"6. Rabbit alone. The rabbit was suddenly placed on the mattress in front of him. The reaction was pronounced. Negative responses began at once. He leaned as far away from the animal as possible, whimpered, then burst into tears. When the rabbit was placed in contact with him he buried his face in the mattress, then got up on all fours and crawled away, crying as he went. This was a most convincing test.

"7. The blocks were next given him, after an interval. He played with them as before. It was observed by four people that he played far more energentically with them than ever before. The blocks were raised high over his head and slammed down with a great deal of force.

"8. Dog alone. The dog did not produce as violent a reaction as the rabbit. The moment fixation occurred the child shrank back and as the animal came nearer he attempted to get on all fours but did not cry at first. The dog was then made to approach the infant's head (he was lying down at the moment). Albert straightened up immediately, fell over to the opposite side and turned his head away. He then began to cry.

"9. The blocks were again presented. He began immediately to play with them.

"10. Fur coat (seal). Withdrew immediately to the left side and began to fret. Coat put close to him on the left side, he turned immediately, began to cry and tried to crawl away on all fours.

"11. Cotton wool. The wool was presented in a paper package. At the end the cotton was not covered by the paper. It was placed first on his feet. He kicked it away but did not touch it with his hands. When his hand was laid on the wool he immediately withdrew but did not show the shock that the animals or fur coat produced in him. He then began to play with the paper, avoiding contact with the wool itself. He finally, under the impulse of the manipulative interest, lost some of his negativism to the wool.

"12. Just in play W. put his head down to see if Albert would play with his hair. Albert was completely negative. Two other observers did the same thing. He began immediately to play with their hair. W. then brought the Santa Claus mask and presented it to Albert. He was pronouncedly negative.

"From the above results it would seem that emotional transfers do take place. Furthermore it would seem that the number of transfers resulting from an experimentally produced conditioned emotional reaction may be very large. In our observations we had no means of testing the complete number of transfers which may have resulted.

"(3) The effect of time upon conditioned emotional responses. We have already shown that the conditioned emotional response will continue for a period of one week. It was desired to make the time test longer. In view of the imminence of Albert's departure from the hospital we could not make the interval longer than one month. Accordingly no further emotional experimentation was entered into for thirty-one days after the above test.

"At the end of this time, a series of experiments, with a Santa Claus mask, a fur coat, a set of blocks, a rat, and a rabbit demonstrated conclusively that directly conditioned emotional responses as well as those conditioned by transfer persist, although with a certain loss in the intensity of the reaction, for a longer period than one month. Our view is that they persist and modify personality throughout life. It should be recalled again that Albert was of an extremely phlegmatic type. Had he been emotionally unstable probably both the directly conditioned response and those transferred would have persisted throughout the month unchanged in form."

The above-quoted material was selected from Conditioned Emotional Reactions, an article by John B. Watson and Rosalie Rayner Watson, first published in the Journal of Experimental Psychology (Vol. 3, 1920, pages 1-14).

Unit 3: Operant Conditioning

Reading Assignment:
(a) Sections 4 and 5 of Learning: Reinforcement Theory.
(b) Excerpt from Do Animals Reason? by E. L. Thorndike (see below).

In Unit 1, you studied the distinction between respondent and operant behavior. In Unit 2, you saw how respondent or reflex behavior gets conditioned. Now, in this unit, we deal with operant conditioning, the most important principle to be considered in this course. Here you will see how behavior may operant on the outside world, and how its effects will determine the likelihood of future behavior of the same kind.

In the selection from Thorndike's paper on "reasoning," you will find an account of some of the earliest experiments ever made on learning through the "law of effect" (operant conditioning was then an unknown term). Try, as you read, to keep Thorndike's observations separate from his interpretations. The former are much more important than the latter in the history of our science.

Study questions:
(Learning: Reinforcement Theory)

1. In your text example of the little girl in the livingroom, what was the conditioned response, what was the reinforcing stimulus, and what was the effect of the reinforcer upon the response?

2. What principle of operant behavior is illustrated by the abovementioned example? Can you define this principle without talking about anything except that which can be observed with one's own eyes? What was Thorndike's name for the principle?

3. What measure of learning did Thorndike use in his studies of animals in "puzzle boxes"? How did the values of the measure change as learning took place?

4. How was conditioning measured in the case of the little girl who secured the chocolate pellets? How would you expect hunger and satiation to affect this measure?

5. What kind of a S and R diagram would you use to represent operant conditioning? To what would your S refer? Your R? Anything else?

6. What is a positive reinforcer? Can you give fresh examples? What state of an organism would be essential for their operation?

7. What is a negative reinforcer? How does a negative reinforcer "strengthen" a response? Can you give fresh examples?

8. Can you define a negative reinforcer in two different ways? Can you give an example of each?

(Can Animals Reason?)

1. What kind of apparatus did Thorndike use in his studies?

2. What method did Thorndike employ? What response (or responses)? What measure? What condition of the organism used?

3. What was the "effect" that strengthened responses in Thorndike's experiments? What kind of "reinforcement" would you say that he used?

4. What evidence would Thorndike have accepted as proof of "reasoning" in his animals?

5. What did Thorndike actually observe? Was progress sudden or gradual? Was it "hit-or-miss" or "purposeful?" Did it differ from the behavior of the little girl who received chocolate for lever pressing? Why, or why not?

6. Which of the following did Thorndike observe and which did he infer? Clawing and biting behavior. Instinctive behavior. Pleasurable results. Connections "stamped in." Smooth paths in the brain.

7. Could he have observed "reasoning?" How?

FAMOUS NAMES:

Edward Lee Thorndike (1874-1949) was one of the world's most productive and most influential psychologists. He began, as have many other leaders in the field, with the study of animal behavior (especially animal "intelligence"), out of which came his "law of effect," but he was soon led into the more practical sphere of educational psychology. He dealt mainly with problems of human learning, using "Right!" as a reward and "Wrong!" as a punishment in the formation of "connections" between certain verbal responses and stimulus situations. He had a long and illustrious career, with more than 250 contributions of scholarly books and papers.

Burrhus Frederic Skinner (1904-) was led from a study of eating behavior of white rats to a new method of research, to a new body of experimental studies, and a new way of thinking about behavior (which is adopted in this text). Using a "repeating" problem box and rate of response as a measure, Skinner did for "voluntary" behavior (he named it "operant") what Pavlov had done for the reflex, giving new life to Thorndike's "law of effect" and opening a field of pure and applied science which has not yet reached its peak of productivity. Following his animal studies (in which he introduced the pigeon to psychology), Skinner has been especially active in the fields of language and education. His invention of a "teaching machine" and use of "programmed instruction" is reflected in the method with which your present course is conducted.

SOMETHING TO THINK ABOUT:

The lever-pressing procedure described in your text has sometimes been called a "free operant" technique. What would a "restricted operant" technique be like? Can you cite an example from your reading in this unit?

"Do Animals Reason?"

"Probably every reader who owns a dog or cat has already answered the question which forms our title, and the chance is ten to one that he has answered "Yes." In spite of the declarations of the psychologists from Descartes to Lloyd Morgan, the man who likes his dog and the woman who pets a cat persist in the belief that their pets carry on thinking processes similar, at least in kind, to our own. And if one has nothing more to say for the opposite view than the stock arguments of the psychologists, he will make few converts. A series of experiments carried on for two years have, I hope, given me some things more to say -- some things which may interest the believer in reason in animals, even if they do not convert him.

"In trying to find out what sort of thinking animals were capable of I adopted a novel but very simple method. Dogs and cats were shut up, when hungry, in inclosures from which they could escape by performing some simple act, such as pulling a wire loop, stepping on a platform or lever, clawing down a string stretched across the inclosure, turning a wooden button, etc. In each case the act set in play some simple mechanism which opened the door. A piece of fish or meat outside the inclosure furnished the motive for their attempts to escape. The inclosures for the cats were boxes and were about 20 x 15 x 12 inches in size. The boxes for the dogs (who were rather small, weighing on the average about thirty pounds) were 40 x 22 x 22. By means of such experiments we put animals in situations seeming almost sure to call forth any reasoning powers they possess. On the days when the experiments were taking place they were practically utterly hungry, and so had the best reasons for making every effort to escape. As a fact, their conduct when shut up in these boxes showed the utmost eagerness to get out and get at the much-needed food. Moreover, the actions required and the thinking involved are such as the stories told about intelligent animals credit them with, and, on the other hand, are not far removed from the acts and feelings required in the ordinary course of animal life. It would be foolish to deny reason to an animal because he failed to do something (e.g., a mathematical computation) which in the nature of his life he would never be likely to think about, or which his bones and muscles were not fitted to perform, or which, by those who credit him with reason, he is never supposed to do. So the experiments were arranged with a view of giving reason every chance to display itself if it existed.

"What, now, would we expect to observe, if a reasoning animal, who, surely eager to get out, is put, for example, into a box with a door arranged so as to fall open when a wooden button holding it at the top (on the inside) is turned from its vertical to a horizontal position? We should expect that he would try first to claw the whole box apart or to crawl out between the bars. He would soon realize the futility of this and stop to consider. He might then think of the button as being a vital point, or of having seen doors open when buttons were turned. He might then poke or claw it around. If after he had eaten the bit of fish outside he was immediately put in the box again he ought to remember what he had done before, and at once attack the button, and so ever after. It might very well be that he would not, when in the box for the first time, be able to reason out the way to escape. He ought, then, if at once put in again, this time to perform deliberately the act which he had in the first trial hit upon accidentally. This one would expect to see if the animal did reason. What do we really see?

"To save time we may confine ourselves to a description of the twelve cats experimented with, adding now that the dogs presented no difference in behavior which would modify our conclusions. The behavior of all but No. 11 and No. 13 was practically the same. When put into the box the cat would show evident signs of discomfort and of an impulse to escape from confinement. It tries to squeeze through any opening; it claws and bites at the bars; it thrusts its paws out through any opening, and claws at everything it reaches; it continues its efforts when it strikes anything loose and shaky; it may claw at things in the box. The vigor with which it struggles is extraordinary. For eight or ten minutes it will claw and bite and squeeze incessantly. With No. 13, an old cat, and No. 11, an uncommonly sluggish cat, the behavior was different. They did not struggle vigorously or continually. (In the experiments it was found that these two would stay quietly in the box for hours, and I therefore let them out myself a few times, so that they might associate the fact of being outside with the fact of eating, and so desire to escape. When this was done, they tried to get out like the rest.) In all cases the instinctive struggle is likely to succeed in leading the cats accidentally to turn the button and so escape, for the cat claws and bites all over the box. These general clawings, bitings, and squeezings are of course instinctive, not premeditated. The cats will do the same if in a box with absolutely no chance for escape, or in a basket without even an opening -- will do them, that is, when they are the most foolish things to do. The cats do these acts for just the same reason that they suck when young, propagate when older, or eat meat when they smell it.

"Each of the twelve cats was tried in a number of different boxes, and in no case did I see anything that even looked like thoughtful contemplation of the situation or deliberation over possible ways of winning freedom. Furthermore, in every case any cat who had thus accidentally hit upon the proper act was, after he had eaten the bit of fish outside, immediately put back into the box. Did he then think of how he had got out before, and at once or after a time of thinking repeat the act? By no means. He bursts out into the same instinctive activities as before, and may even fail this time to get out at all, or until a much longer period of miscellaneous scrabbling at last happened to include the particular clawing or which works the mechanism. If one repeats the process, keeps putting the cat back into the box after each success, the amount of the useless action gradually decreases, the right movement is made sooner and sooner, until finally it is done as soon as the cat is put in.

"This sort of a history is not the history of a reasoning animal. It is the history of an animal who meets a certain situation with a lot of instinctive acts. Included without design among these acts is one which brings freedom and food. The pleasurable result of this one gradually stamps it in connection with the situation "confinement in that box," while their failure to result in any pleasure gradually stamps out all the useless bitings, clawings, and squeezings. Thus, little by little, the one act becomes more and more likely to be done in that situation, while the others slowly vanish. This history represents the wearing smooth of a path in the brain, not the decisions of a rational consciousness."

Excerpt from a paper (Do Animals Reason?) by Edward Lee Thorndike in the Popular Science Monthly, 1899, 55, 480-490.

Unit 4: Extinction and Intermittent Reinforcement

Reading assignment:
Sections 6 and 7 of Learning: Reinforcement Theory.

In this unit, we pass from the problem of acquiring behavior to that of eliminating it, after which we consider how it is maintained. We move, that is, from the principle of conditioning to that of extinction, and then into the field of intermittent reinforcement, which involves both conditioning and extinction.

The reading of this assignment will help you to understand, first, how "habits" are "broken," and, secondly, how behavior "keeps going," even when the rewards are few and far between -- how the hunter or the fisherman maintains interest in his sport, why the Fuller Brush man keeps ringing doorbells, how the chronic gambler becomes a victim of the game, and why the seasoned veteran in almost any field is often loath to "hang up his uniform" and retire from active duty.

Study questions:

1. Can you state, in your own words, the fundamental law of extinction? Does this law apply to unconditioned behavior?

2. Can you describe, in terms of conditioned stimulus, unconditioned stimulus, and conditioned response, the extinction of some

respondent? What happens to the conditioned stimulus when extinction is complete? What happens to the conditioned response?

3. What is the effect of extinction upon an *operant* response? When is the extinction complete?

4. How might *emotion* show itself as a result of operant extinction?

5. How might a failure to get respondent extinction be related to operant *conditioning*?

6. What is meant by "intermittent" reinforcement? What would happen to the pattern of a pigeon's responding after a long period of reinforcement on a "fixed-interval" schedule? What is it that leads us to say that a pigeon "tells time" while working on a fixed-interval schedule?

7. How does the *procedure* of fixed-ratio reinforcement differ from that of fixed-interval?

8. What do you think would be the difference between a *fixed*-ratio schedule of 20 (20 responses per reinforcement) and a *variable*-ratio of 20? Which produces the steadiest, least-interrupted rate of response? Why? (Don't talk about the pigeon's subjective "expectancy"!)

9. Which type of schedule produces the greatest resistance to extinction -- *continuous* or *intermittent*? Which shows more "emotional" behavior in extinction? Why does one schedule produce more resistance to extinction than another?

10. What effect does amount of time between reinforcements have upon rate of responding on a variable-interval schedule?

TWO DISCOVERIES:

1. "I will describe observations on one of our recently acquired animals [in which conditioned reflexes were developed] with the following important variation in the usual method. The first agent to which conditioned properties were to be given was applied alternately with and without reinforcement by food. The conditioned reflex developed comparatively quickly (by the 20th application). In the case of the next stimulus the reinforcement was given at every third application. The reflex developed even quicker than before (by the 7th application). The animal became, however, extremely excited. Finally a third agent was reinforced only at every fourth application, and in this case the conditioned reflex failed to develop and the animal became somewhat drowsy."

I. P. Pavlov, *Conditioned Reflexes*,192

2. "One pleasant Sunday afternoon I surveyed my supply of dry [food] pellets and, appealing to certain elemental theorems in arithmetic, deduced that unless I spent the rest of that afternoon and evening at the pill machine, the supply would be exhausted by ten-thirty Monday morning.... I decided to reinforce a response only once every minute and to allow all other responses to go unreinforced. There were two results: (a) my supply of pellets lasted almost indefinitely, and (b) each rat stabilized at a fairly constant rate."

B. F. Skinner, A Case History in Scientific Metho
In the American Psychologist, 1956

SOMETHING TO THINK ABOUT:

(1) In each of the quotations above, intermittent reinforcement is reported. What schedule is described by Pavlov? By Skinner?

(2) How would you use reinforcement in order to make an organism respond at its fastest possible rate? At a slower than normal rate?

Unit 5: "Superstitious" Behavior; Low-Rate Responding; Punishment

Reading assignment:
Sections 8, 9, and 10 of Learning: Reinforcement Theory.

This unit deals with three different questions, each of which is related to facts and principles that you have already considered. First, what happens when reinforcement is given without any reference to what an organism may be doing -- that is, when reinforcement is not contingent upon the occurrence of any specific response? Secondly, what happens when reinforcement is given only to responses that follow other responses by a greater-than-average period of time? And, thirdly, can conditioned operant responses be weakened by punishment with a negative reinforcer as well as by extinction?

Study questions:

1. What is the difference between contingent and non-contingent reinforcement?

2. What behavior is strengthened in the case of contingent reinforcement? Non-contingent?

3. How would you go about it to set up "superstitious" behavior in an animal or a human being? How often would you reinforce what behavio and why? Would a "time discrimination" appear?

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4. How would you set up low-rate responding in some organism, say a white rat? When would you reinforce a response, and when wouldn't you?

5. What is the difference between a one-minute fixed-interval schedule of reinforcement and a schedule in which responses are reinforced only whenthey are one minute apart?

6. What happens to inter-response times (IRT's) under training in low rate?

7. How does a time discrimination develop in low-rate training?

8. How does "superstitious" responding develop as a result of low-rate training? Why is this responding "non-contingent?"

9. What is the difference between extinction and negative reinforcement? How do you define a negative reinforcer? (See section 5.)

10. Can you give an example in which negative reinforcement is contingent upon a response? In which it is non-contingent? (This is a hard one!)

11. Under what three basic conditions can negative reinforcers be applied to a specific operant?

12. What is the first effect of a strong negative reinforcer upon an operant response?

13. Under what conditions will the punished operant recover its strength? What conditions are more favorable than others? Can the effect of punishment on a response be diminished even though the response does not occur?

14. Can you explain in your own words the following paradigm (para-dim):

    SHOCK — —
    > EMOTIONAL RESPONSES
    PLACE — —

    What kind of conditioning does this paradigm represent? Why are the emotional responses important? What do they do to operant behavior? How would you extinguish the conditioned effects of the punishment?

15. What could one mean by saying:
    (a) Punishment really protects an operant from extinction?
    (b) Escape only postpones extinction?
    (You may have to think about these!)

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A WORD OF QUALIFICATION:

The booklet on Learning which serves as your text for this abbreviated course is itself abbreviated. Much more could be said about every topic there considered, and some of what could be said would raise some further questions. For example, there are a few studies of low-rate responding in which there was no evidence of superstitious chaining like that described in Section 8; and there are studies of *extreme* punishment from which there does not seem to be recovery no matter how long the organism is exposed to the circumstances in which the punishment was originally administered. The broad outline of our picture is clear, the principles are firmly based on countless observations, but there are still enough puzzling details to challenge a student of behavior, to encourage him to further study and research, and, above all, to keep him modest. A brief account is useful in presenting a bird's-eye view of any field of knowledge, but it is most useful when it leads the student to examine the field more closely and,ultimately, to work within it.

SOMETHING TO THINK ABOUT:

Section 9 of your text assignment describes the way in which a boy was taught to make a verbal response (*flowers*) at a slow, steady rate. Suppose you wanted the little girl in Section 4 to *press a lever* at the same slow rate; how would you get her to do it? What kind of superstitious behavior, if any, would you expect her to develop?

Unit 6: Generalization and Discrimination

Reading assignment:
Sections 11 and 12 of *Learning: Reinforcement Theory*.

This unit deals with the *stimulus control* of behavior, one of the oldest and most-investigated problems of psychological science. You are already acquainted with some aspects of this topic, through your study of the reflex, in Unit 1, and of the conditioned reflex, in Unit 2. You will now go still further with respect to the conditioned reflex, and you will consider the stimulus control of operant behavior as well. The story will get more complicated in this unit, but it will still be comprehensible. You may even find a certain excitement in the discovery of new and meaningful connections between facts and principles you already understand.

Study questions:

1. What is *generalization*? (Don't say, *Generalization is when*...!) From whom did we get the term? What did Thorndike call it? How does it apply to the ape with the two poles? Can you give an example from your own experience.

2. A dog was conditioned to salivate at the sound of a 1000-cycle tone. What happened when a 900-cycle tone was then presented? A 100-cycle tone? What is the general rule that here applies?

3. In addition to tones, what kind of stimuli will generalize? Along what scales or continua?

4. Which of the following suggest generalization, and why?
   (a) All Eskimos look alike to me.
   (b) We have a new leg on our sofa.
   (c) He came in on the plane from Detroit yesterday.
   (d) I never could tell a dot from a dash.
   (e) The hands are missing from our clock.

5. What is meant by "generalization of extinction?" Would you use S^D or S^{Δ}s in testing for such generalization?

6. How does the procedure of discrimination cause generalization? Can you give a respondent example? An operant example?

7. Can you construct paradigms (schematic diagrams) for operant discrimination? Respondent discrimination?

8. Since there is generalization through conditioning and generalization through extinction, why don't the effects of reinforcement and non-reinforcement counteract each other, making a discrimination impossible?

9. Must a discrimination always be based on continuous reinforcement in the presence of one stimulus and extinction in the presence of another? Defend your answer.

10. What is a multiple schedule of reinforcement? Can it involve discrimination? How would you know? Can you give two examples of such a schedule?

A FAMOUS NAME:

Gustav Theodor Fechner (1801-1887) was a German physicist, psychologist, and philosopher, as well as a poet, a mathematician, a physician, and a student of aesthetics. He is best known for his laboratory studies of the capacity of human beings to discriminate small differences in the intensity of visual, auditory, and other modes of stimulation, which he carried out under the general heading of psychophysics. His methods of investigation formed a solid basis for countless later studies, in Germany, the United States, and elsewhere, on human sensing and perceiving.

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Unit 7: The Differentiation (Shaping) of Response

Reading assignment:
Section 13 of Learning: Reinforcement Theory.

The work of this unit is far more important than the size of the reading assignment suggests. In the first place, it focuses upon the effect that reinforcement has upon response, when no attempt is made to alter stimulus control. This is the kind of focus which is represented in many acts of human skill, all the way from horseshoe pitching and dart throwing, at one extreme, to calligraphy and the heights of human oratory, at the other, with many crafts and occupations in between.

Secondly, it points up a procedure of changing behavior which has enormous value in all forms of human education. This is the method of "successive approximations," or, more simply, "advance by small steps" -- a procedure which applies not only to changes in response but to shifts in the stimulus control thereof, as seen especially today in the field of teaching machines and programmed instruction.

Study questions:

1. Which of the following terms comes closest to the meaning of differentiation: discrimination, skill, shifting, or shaping? Which of these applies most clearly to response?

2. With respect to the main experiment discussed in your assignment, please answer the following questions:
   (a) What subjects were employed?
   (b) What response was studied?
   (c) What was the subject's preliminary task? With what results?
   (d) In the main study, what reinforcement was given, and when?
   (e) What reinforcement schedules were employed?
   (f) How was the schedule related to ease of shifting from one force of response to another? (The word shifting is used in its everyday, non-technical sense at this place in your reading.)
   (g) What measures of response were used by the experimenter?

3. Why is variability necessary in order for a response to be differentiated?

4. How does selective reinforcement work in differentiating a response? Can you give an example?

5. What is meant by successive approximations to some behavioral goal? How would you use this procedure in teaching a child to wait 30 seconds between responses in order to be reinforced?

6. In what way, if any, does the experimenter change the outside stimuli of an organism in bringing about a differentiation?

7. Can you illustrate, with two paradigms, the difference between an operant discrimination and a differentiation?

8. Why can it be said that discrimination and differentiation go hand in hand in life's daily affairs? Can you give some examples of their cooperation?

SOMETHING TO THINK ABOUT:

> "It seems to me," said the freshman, "that operant behavior is different from respondent behavior in a way you didn't mention. Operant behavior can be differentiated; respondent behavior can't!' What do _you_ think?

Unit 8: Chaining

Reading assignment:
Section 14 of _Learning: Reinforcement Theory._

One of the most important aspects of human behavior is its _serial_ nature. Chaining is present everywhere. It is seen when the infant reaches for his bottle, and when later he begins to walk and crawl. It appears in vocal form when several sounds are first put together into what we call a _word_, and when words are put into _sentences_. It is shown in almost every act of _skill_, in every case of _memorizing_, and in what commonly goes by the name of _thinking_ or the "_association of ideas_." It is the core of one's ability to _follow directions_ or _stick to the point_, but it is equally obvious when one _gets off the track_ or _permits his mind to wander_. It is no less present in the "_free associations_" of the psychiatric patient than in the learned discourse of the world's great thinkers. It may even be _superstitious_, as in low-rate conditioning (section 9) or when the reinforcement of some act is delayed, when we fill the time with behavior that _seems_ to produce the desired effect. Chaining is everywhere. The basic law is always the same. _One response produces the stimulus for another_. How it does so is the object of our present concern.

Study questions:

1. In 1893, what would psychologists have discussed instead of the general topic of _learning_? Within what present-day subdivision of learning would these matters be discussed today?

2. What two developments led to increased interest in serial learning (chaining) at the beginning of this century? What part did John B. Watson play in this?

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3. What do we think today about Watson's views of chaining?

4. What is the basic law of chaining? Can you construct a paradigm that illustrates this law, identifying each symbol as a discriminative stimulus, differentiated response, and so on?

5. Why is it sometimes difficult to single out the stimulus elements in a very well established chain?

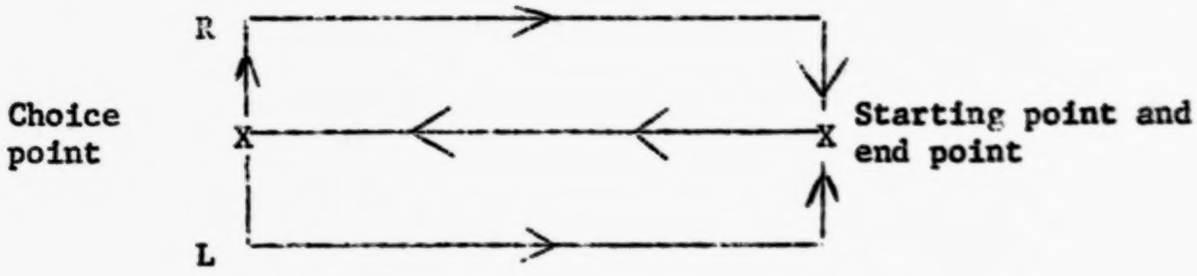
6. Can you list, in proper order, from beginning to end, the principal stimuli and responses of the chain displayed by Pliny, the "educated" rat?

7. Can you give an example of the way in which differentiation may have been needed in establishing a part of Pliny's chain? How does the need for differentiation affect the speed of establishing a chain?

8. With respect to verbal serial-learning studies, please answer the following questions:
   (a) What do the subjects most commonly have to learn?
   (b) How is speed of learning related to number of items to be mastered?
   (c) How is speed of learning related to generalization?
   (d) How is length of list of items related to grouping of items?

9. In maze-learning studies of chaining, where are the important successive stimuli? What are the successive responses? How is maze mastery related to amount of generalization? How could the amount of generalization be increased in a maze? Decreased?

10. Here is the floor plan of a temporal maze.



The problem for a white rat is to go from the starting point to the end point (at the same place) on four successive runs. On the first two runs, he must take the right-hand route; on the second two, he must take the left-hand route.

(a) Why is the problem difficult for the white rat?

(b) Can you design a maze with four choice points which would be easier for the rat to learn than this one; and can you explain why?

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SOMETHING TO THINK ABOUT:

It has been said that Pliny, the rat whose achievement is described in your reading assignment, learned his chain backwards. What could such a statement mean? Do you think you could learn a poem backwards? If so, how would you go about it?

A FAMOUS NAME:

Hermann Ebbinghaus (1850-1909), a young German philosopher, tutoring in Paris, discovered Fechner's Elements of Psychophysics in a bookstall on the Seine. He was stirred by the book to investigate the field of memory and forgetting in a scientific fashion, as Fechner had investigated sensation(discrimination). To avoid the effect of learning material with different amounts of interest or familiarity, as in passages of poetry or prose, he invented the nonsense syllable (two consonants, with a vowel between, such as fub, giz, caj, fas, and so on). Using himself as experimental subject, he memorized lists of different lengths, under various conditions, and tested himself for retention after different periods of time. His book on Memory, which resulted from several years of research, is a classic in the history of serial learning in human beings.

Unit 9: Secondary Reinforcement (Positive)

Reading assignment:
Section 15 of Learning: Reinforcement Theory.

It is clear that some well-known reinforcers, often called primary, such as food and water, possess the power to strengthen behavior almost from the day of one's birth. But it is also clear that other reinforcers are developed during an organism's lifetime. For example, the click of the magazine that delivers food to a hungry rat when he presses a lever may come to be rewarding in itself, and can be used to strengthen other responses than lever-pressing. Or, in the case of human beings, a nod of the head, a smile, a kind word, some visible mark of respect, affection, or submission -- even a metal or paper token, such as money -- may serve as effective reinforcers for many responses on many occasions. They may not be reinforcing to begin with. For some persons, they may never become so. But no one will deny that they are generally important in our society. These are the secondary or conditioned reinforcers with which the assignment deals.

Study questions:

1. What basic condition must exist if food or water is to be reinforcing
2. What is a secondary reinforcer? Can you give examples that an observer would be able to see or hear?

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3. What is second-order conditioning? What stimulus in Pavlov's famous experiment would be called a secondary reinforcer?

4. Please answer the following questions with respect to Moos, the chimpanzee.
   (a) What was his first task? His second task? His third task?
   (b) What were the reinforcers in his first and third tasks, respectively?
   (c) What discrimination was made by Moos in his second task? What was the S^D? S^Δ? Which became positively reinforcing?
   (d) Can you construct the chain of stimuli and responses involved in Moos's final task?

5. How could you prove that an S^D for one response could be a secondary reinforcer for another? How is this related to the statement that chains are "learned backwards?"

6. What has secondary reinforcement got to do with delayed reinforcemen

7. What is a generalized reinforcer? How would you make the sound of a whistle into a generalized reinforcer for a dog?

8. When we say that attention is reinforcing to a child, we really mean that some observable stimulation will strengthen his behavior. What kind of stimulation might this be?

9. What kind of observable stimuli would you look for in the case of approval? Affection? Token reward?

SOMETHIBNG TO THINK ABOUT:

(a) If the S^D in a study of discrimination can become a positive secondary reinforcer, do you suppose that the S^Δ can become a negative secondary reinforcer?

(b) What is the practical value of a secondary or conditioned reinforcer? Of a generalized reinforcer?

A FAMOUS NAME:

William McDougall (1871-1938) was one of England's best-known psychologists, who spent his final years of teaching and research in the United States -- first at Harvard,and then at Duke. A man of many talents and broad training (he came to psychology after work in medicine, physiology, and philosophy), but one who often associated himself with causes, enterprises, or ideas that were unpopular with his colleagues -- spiritualism, Lamarckianism, interactionism, the group mind, and so on. He wrote highly respected books in physiological, general, social, and abnormal psychology. His treatment of instinct helped pave the way to the later concepts of drive (hunger, thirst, sex, activity, etc.) and generalized reinforcement. Also, his distinction between "real behavior" and "reflex behavior" was a clear anticipation of our modern operant and respondent.

Unit 10: Secondary Reinforcement (Negative)

Reading assignment:
Section 16 of Learning: Reinforcement Theory.

This is the final unit of your compact course in the principles of behavior, and not the least important one. The assignment deals all too briefly with a very significant area of modern psychological practice and theory, that of escape and avoidance. The influence of aversive stimuli (primary or secondary negative reinforcers) is of increasing interest to students of behavior, especially to those who would use their knowledge in the relief of human suffering. More and more does the modern psychologist and psychiatrist look to a history of punishment, by way of negative reinforcement or of extinction, in searching for the causes of behavior disorder; and more and more do they find escape and avoidance to be important features of maladjustment in the modern world.

Study questions:

1. How did Bekhterev's method of conditioning differ from Pavlov's? Did Bekhterev always pair the conditioned stimulus with the unconditioned stimulus in his training procedure? What was the unconditioned stimulus? The conditioned stimulus? How did the response to the conditioned stimulus compare with the response to the unconditioned stimulus?

2. Why is it said that Bekhterev's method involved avoidance?

3. What were the findings in Bekhterev's laboratory with respect to the results of conditioning normal and subnormal children?

4. What did American researchers discover about Bekhterev's method and its use?

5. How would you define a secondary negative reinforcer?

6. In the experiment with rats in the black and white compartments, what was the primary negative reinforcer? What was the secondary negative reinforcer? How do you know it was negative? Why was this reinforcer a conditioned stimulus in the Pavlovian sense? How was operant behavior measured in this experiment? What was the reinforcement for this operant behavior?

7. In the above-mentioned experiment, what would have been the result of long confinement in the white room on the second day of the study? What would have happened to running speed with more than 60 runs on the third day? Could running have been conditioned through escape from the white compartment simply through having shocked the animals earlier in that place?

8. How could conditioned foot-withdrawal be treated as avoidance?

9. How might avoidance "conflict" be involved in human hand-withdrawal conditioning?

10. What do you think is the difference between escape and avoidance? Can you give everyday examples?

11. When might you be justified in saying that an organism is escaping from his own movements? Would this be avoidance behavior? Explain.

12. Why are phobias, anesthesias, and "changing the topic" of a conversation sometimes called avoidance? What are the reinforcers?

13. How is avoidance behavior extinguished? BE CAREFUL. Remember your definition of extinction!

14. How might avoidance explain the lasting effects of punishment?

A FAMOUS NAME:

Vladimir Mikhailovitch Bekhterev (1857-1927) learned medicine in Russia, experimental psychology in Germany, and psychopathology in Paris. He wrote extensively on nervous disease and on psychology, which he preferred to call reflexology. He became Pavlov's outstanding Russian rival, arguing that motor or skeletal-muscle conditioning had more significance for psychology than salivary-gland conditioning. His method has been more popular in the United States than Pavlov's, but is no longer thought to be a clear case of respondent conditioning, since it permits operant avoidance behavior to develop.

CHAPTER 6

CLINICAL TRAINING PROGRAM

The training procedures and curriculum content for principles of behavior have already been described in Chapter 5. There remains the account of training carried out to extend these principles into actual practice with children and the practical day-to-day details of how the total program was implemented.

Because the Linwood staff needed to be recruited from persons without clinical experience there was the problem of developing both the practical and clinical skills necessary to do therapy. The educational backgrounds also varied between high school and college, so there was a wide range of verbal ability among the students. Jeanne Simons judged that the most essential skill underlying clinical competence was an ability to observe and remember the small details of the children's conduct. This was the skill that was one of the major goals of the academic training program. Even after a trainee could describe behavior in detail, he had to develop fluency with actual behavior to remember his observation and order them into a pattern so that they can lead to valid clinical prediction and summary. Much of the clinical training program was possible because an objective technical language about behavior allowed people to communicate accurately and to describe actual procedures in plain English to students.

Structure of Training Program

Since the clinical training program was designed to teach the students the clinical methods in practice at Linwood, the content of the training needed to come from Jeanne Simons. The project staff designed teaching situations and instructional aids to make the instruction possible. At every stage, a technical objective language was emphasized as the major tool by which clinical methods could be conveyed to the students.

Materials

Jeanne Simons's therapeutic activities with the children were the basic materials for the clinical training program. Students were exposed to Jeanne Simons's therapy procedures (1) by observing her work with children when she came into their rooms to interact with the children under their charge; (2) by observing her in a special teaching environment where she worked for one or two children at a time, largely for instructional purposes; (3) video tapes of Jeanne Simons and other students working with children; (4) written descriptions, such as those of Chapter 4 of Jeanne Simons and others working with children; (5) group discussions; (6) demonstrations by Jeanne Simons of special techniques and use of materials; (7) role playing; (8) brief student observations of children followed by their communication to others; (9) animal training followed by discussions of the relevance to observing children; (10) improvising new procedures; (11) supplementary readings.

These were the raw materials. Like any other kind of training materials the crucial problem was ways of incorporating the content into the student's repertoire.

Time and Scheduling

The clinical training program began slowly at the start of the project because so much effort had to go into the academic training for the Linwood staff and clinical training for the project staff. When, during the second year emphasis shifted to clinical training, it soon became clear that observational experiences, study and interview time, and discussions would take much time and compete with the full-time responsibilities with children. One approach, individually scheduled study periods paced through the day, tended to interrupt activities and to minimize interaction and discussion with other staff members. Since interaction with other staff members was an important reinforcer for practicing technical language and improvising new methods this arrangement was not satisfactory. A more effective plan, one hour daily 9:00 - 10:00 a.m. study hours for all staff was established. This definite time period, specifically allocated for training, seemed to provide predictability which helped stabilize the program. Other contacts between Jeanne Simons, the project staff and the clinical trainees still occurred but not on a scheduled basis.

When the training hour became routine, the clinical staff requested more formally scheduled time. Two additional half-hour interview sessions weekly were set up with the director of the training program for each staff member. These were designed to include time for a brief interview on *Behavior Principles* and an opportunity to relate the general principles to descriptions of the children's conduct.

The study hour scheduled from 9:00 - 10:00 a.m. preceded the arrival of Day-Care children, so the children's rooms were used for study. Since these rooms were such an integral part of the staff member's work, this setting diverted staff members by prompting thoughts about the preparations for the day's program. Children in residence also diverted the students from study. Some of these rather disrupting effects were alleviated when a new dining room, completed during the third year of the project, was available for individual study.

Books, articles and study materials were kept in a central place from which they could be taken for home use or for use at other places in Linwood.

Training Staff

Mary Carol Perrott, working closely with Jeanne Simons, developed the early phases of the clinical training, although much of the emphasis was on general principles of behavior. She experimented, together with Jeanne Simons, with video recordings and direct observations of children's behavior. C. B. Ferster interacted with the staff in group discussions about the children one or two times weekly. During the final year of the project Charlotte Farrand assumed responsibility for integrating the behavior principles with clinical educational goals.

Individualizing Instruction

Because the clinical staff at Linwood came from such different backgrounds, both educationally, socially, and professionally, it was very necessary that all of the instructional procedures be individualized so each student could go at his own pace. The very different backgrounds in language ability among the students posed one of the first problems since most of the training materials pre-supposed the language facility at the college level. One staff member who exemplified this kind of difficulty was a high school graduate who had training as a practical nurse. The problem came to focus when her progress in the training program slowed to a virtual standstill without any apparent reason. The labored way in which she was proceeding through the various texts suggested that the training program was too difficult for her. So the decision was made to reduce the amount of material required for each interview. Instead of an interview following seven or eight pages of text, one now followed two, three, or four pages. Extra attention was paid to opportunities for practicing the new technical language and developing great fluency with many examples of children's behavior from her own experience following each interview. The result was that her interest in the program was reinstated almost immediately and her anxiety diminished.

This example provided a general formula for dealing with the diverse levels of ability, training, and experience. Instead of reducing the difficulty level of the material or leaving out important matters, the amount of material that a student was to accomplish at a given time was made very small and extra support was given in the form of collateral materials designed to reinforce the newly-developed behaviors. Thus, we were able to preserve the high level of technical competence that was required for the effective application of principles of behavior and at the same time take into account the variations in verbal development. Other students, for example, could tackle two interviews during a single training period as well as bring into their discussion additional articles which they had read.

Records

In order to stimulate each staff member's awareness of his rate of progress, two records were kept. A general chart, posted publicly, recorded the dates for each time all staff members spoke or listened in an interview. A second record, a cumulative curve of progress through the course, emphasized the individual student's rate of progress. Students reported that the graphs gave them feedback of their achievement and it was possible at a glance to project how long it would take a student to complete the course.

Notebooks for study were provided for each individual to facilitate use of resource materials. They recorded anecdotes, questions for conferences or group discussion, and notes of group discussion which provided frequently used materials for the clinical instructors to make contact with the student at his current level of observation and achievement.

The Curriculum and Materials of the Training Program

This section will describe the content of the educational experiences to which the students were exposed. Some of the training procedures conveyed clinical skills which could be taught without specific references to general principles of behavior while others dealt with matters which provided practice for behavior principles by extending them into the complex natural environment.

Instructor Conferences

Following each interview the students carried out on sections of Behavior Principles there was an opportunity to talk to Charlotte Farrand, Jeanne Simons, and other project staff about the relevance of the principles to their own experiences in therapeutic work. In these discussions the staff members frequently described incidents they had observed with the children they worked with using the language from the principles of reinforcement. At an early stage of training, for example, one staff member described record playing as a positive reinforcer for a child who is observed to play with records frequently. The therapist then introduced a procedure in which the child needed to complete a task such as replacing one record before he could put another in the record player.

The following text taken directly from a transcription of a staff member's discussion shows the kind of situations which staff members described first in ordinary language and later in the terms of the principles of behavior.

> "Jerry and Mr. R. had been engaged in a kicking game and after a period of time Jerry began to kick the ball down the hill where the maintenance man was mowing the lawn. Mr. R. had told the children this was off limits. Jerry ran down the hill after the ball, looking back several times at Mr. R. Mr. R called to him reminding him he was not to be there and that he would not chase him but would wait until he returned to the top of the hill. The ball play continued with Jerry occasionally returning to the top of the hill to kick the ball to Mr. R. At this point, Mr. R would shake hands with Jerry or give him some attention in some

> way, but whenever he kicked the ball down the hill, he was ignored. Mr. R observed that Jerry kicked the ball down the hill fewer times and would remain at the top of the hill for longer periods of time. Finally he no longer kicked the ball down the hill.

The detail, precise language, and behavioral orientation of the account already is evidence of the course's impact on the student. Conversely, the limited scope of the observation and the simplicity of the observation reflect the beginning level of the student's training. Frequently the instructor asked the student for examples from the student's experience to illustrate the specific behavioral process which was discussed in the previous interview. After an interview in Chapter 5, for example, when aversive stimuli which derive their properties from the loss of positive reinforcement are being discussed, the student would be asked for an example of such an aversive stimulus from some current experience either with their own children or with some others who had recently been observed.

Animal Experiments

Even though many of the behavior principles came from animal laboratory experiences the project training program emphasized human behavior wherever possible. Jeanne Simons's experience in carrying out student exercizes with pigeons convinced her that the experience was a very important one for the beginning therapist so this training became a routine part of the program. Jeanne Simons found the pigeon exercizes valuable not because children were like pigeons, but because working with a pigeon required a detailed observation comparable to that needed by a therapist. Each therapist at Linwood routinely carried out the following two experiments which are described in the text, Behavior Principles.

(1) Increasing the frequency of a performance already in the animal's repertoire. The student selects some performance that occurs occasionally and increases its frequency by reinforcement. He then proves that the increased frequency occurred because of reinforcement by discontinuing reinforcement and recording the decrease in frequency. This demonstration has proved to be very effective for showing students that reinforcement is a fact of nature and a procedure.

(2) Successive approximation. The student selects some complex act, such as having the bird stand on a pedestal, putting its head through a tube, jumping high off the floor, hopping on one leg, putting one leg into a cup or carrying an object in its beak and puts it into the bird's repertoire by successive approximation. Such an experience conveys to the student vividly how necessary it is to observe the subject's behavior in detail and pace his requirement to it. Such an exercise conveys vividly that the desires of the experimenter are less important than the current repertoire of his subject.

Chapter 6

Jeanne Simons describes the value of the pigeon experiment for the Linwood staff as follows:

> After a staff member described their experiences with pigeons I asked for examples from their children without the use of operant language. On the second or third interview we compare it with the tiny steps they took in the pigeon experiment. In most cases we discovered that there is quite a contrast between the tiny steps they took with the pigeon and the very big steps they tend to take with children in their day-to-day therapeutic activities. We repeat this over and over again in different contexts until they can see how any of the child's activity can be broken down into the same kind of tiny steps they used to condition the pigeon. When we feel that they can do this adequately, we ask them to discuss the same kinds of events using operant language. The advantage of doing it in this way is that the staff will eventually train themselves to observe and use tiny steps instead of being continually dependent on us. My hope is that they will find the same small steps working with the children that they used in successively approximating behavior in the pigeon.

The following text is a transcription of a conversation, following the animal experiment, between Jeanne Simons (JS) and one of the Linwood therapists without previous experience (AS) who has been working at Linwood approximately six months. The topics covered in the discussion included the student's increased ability ot observe sensitively and accurately, the necessity of waiting for the emergence of new performances before introducing new materials and identifying a chain of behavior in the child's repertoire.

(AS) When we left off with our discussion the other day, you were asking me, "Why can I do this group activity with the children now and three months ago it was so difficult." We were going to tie this in also with the pigeon experiment that I did at Georgetown.
(JS) I think there are two separate questions. The first one is connecting the child who asks for blocks with the pigeon pecking for food. If we treated the pigeon like we treat our children sometimes, we would expect him to say, "I'm interested in food. Would you please give it to me whenever I move or do something?" Expecting a child to ask you for the blocks is as big a step as expecting a pigeon to ask you. What we have to go into is the accumulation of little steps and experiences which make it likely that a child will be inclined to play with blocks even though he hasn't said so. (AS) I thought the main point of the pigeon experience was observing. It is true that neither the pigeon nor most of our children can talk and ask for things. We have learned that "to stay behind the child," we need to be able to watch and observe him to see what he is doing so we build on it.
(JS) When you saw the pigeon for the first time what did you do?

(AS) I observed the pigeon for a while to see what performances he was emitting. (JS) What performances did you see? You can't increase the bird's behavior until you have some performances you want to increase. (AS) He was walking around in the cage, he was raising his head, occasionally pecking the key and the water cup inside the cage. Actually I wanted to reinforce a performance that was very obvious, so I picked pecking the cup because this was very distinct and had occurred a few times. Once the pigeon pecked the cup I gave the reinforcer immediately. There was a little hand switch which I could press. When I pressed the button, the food magazine operated and made a sound which could follow immediately after the bird's peck and the bird went over to get the food for the period of time that was allotted. The frequency of pecking the cup increased, not so fast at the beginning, but very substantially after three or four reinforcements. (JS) What happened to the other behaviors that you observed at the start, such as the head lifting and the walking around and the other things the bird was doing. (AS) It became less frequent after we increased the frequency of pecking at the cup. In the next experiment we carried out extinction by no longer giving the bird food when he pecked the cup. The pigeon pecked the cup for a while, actually went over to the food magazine and the frequency of pecking the cup gradually got lower and lower until it was about as high as it was before I reinforced it. (JS) What happened to the behaviors you observed at the start of the experiment which had lessened when the bird started pecking at the cup? (AS) They eventually picked up again.

In the third experiment I reinforced a more complicated performance by successive approximations. I watched the level at which the bird held his head normally. When he raised it to a higher level I reinforced it gradually, it was in steps, I would wait until he raised it a little higher and then reinforced it. And then finally, I got him up on his tip-toes so that I operated the feeder only when he stretched. There were marks on the cage where you could as the bird went up higher. (JS) So you had a line where you would eventually get the pigeon to reach and you reinforce every steps toward that. You didn't just wait until the pigeon came out with the final performance. Now if you take the pigeon standing on his toes, that reminds me of the conditions under which Tina would ask for blocks. Now in the case of Tina, you just have to follow her around and let her do her job. But, what about if the blocks were in the basement would she have asked for them? Think about the example of the pigeon who is already in the cage, the lines are already on the wall. There is already a cup. Suppose we are dealing with a child who can't do so many things like Tina and who has perhaps never palyed with blocks or been familiar with them. Now how can you compare the child and the pigeon? (AS) I think I would find some way to gradually introduce him to the blocks. Maybe we could start with just jumping off one of them and build from there. (JS) You have already gone too far, let's go back. You don't know whether the child can jump. Begin with the blocks somewhere in the cabinet. You know they are there but the child doesn't pay much attention to them. He may glance at them, but he doesn't know that the blocks are there. (AS) Well, he might walk to the blocks and maybe touch them. (JS) And, what do you do then? (AS) I think I would say the word "blocks" and then perhaps help the child to step onto the blocks and to jump off. (JS) I think if you compare this with the pigeon you would come to the conclusion that jumping on and off the blocks is already too big a step compared to the initial repertoire you have already described for this child. Ask the child to pick up a block or pile some on top of each other. Observe what he does when you place the blocks in his vicinity. This is some of the initial data from which you could decide how to increase the activity on or around the blocks. You shouldn't think of the blocks and what they are supposed to be used for but instead concentrate on all the different ways in which the child could do things with them. It could be held, you could scoot it down, you could sit on it, you may stand on it, you may pile them up, or you may throw it. Just as you watched the pigeon to observe what he did and then reinforces one of those performances, you can watch the child as he spends time in the vicinity of the blocks.

Direct Observation of the Children's Behavior

This section describes several training procedures and materials which were designed to teach the students how to observe and remember the significant details of thiers and the children's conduct. We judged that sensitive observation of the fine grain details of behavior and the ability to remember accurately what has been observed are the basic skills of the therapist.

Jeanne Simons commented on observational skills as follows: "I think we take observation too lightly. It is surprising how few people can observe accurately. I think the video tapes, with the sound, the child and the interaction with the therapists is too complicated for most of our staff to begin with. Last week I decided to let the staff observe a fixed scene. I chose a mobile with a balanced roof and nine people dangling from strings. Each staff member observed the mobile alone to prevent interference from other staff members. They could study it, touch it, and manipulate it, and then write a description of what they saw."

The students made two kinds of errors. They overlooked very many important details and over-described other tiny details less essential than the ones they omitted. No one noticed, for example, how many little figures were hanging yet they mentioned that the figures had hats. There were some make-believe flowers, three groups of three each on the top of the mobile which were described as "cotton." No one mentioned that the entire structure was hanging from a string. And, someone reading the descriptions wouldn't ever have the idea that a mobile is being described. I mentioned the difficulties that the staff member had in observing, not to be critical of her, because she really didn't have the background to be able to make this kind of detailed observation, but it indicates how it is necessary to begin at the very start in training staff members to observe a child. This particular staff member, incidentally, might have been able to do a better job if she were talking about the children. The task of teaching a staff member to observe such a mobile would have much in common with the way one of the Linwood children would handle this same situation. It is quite likely that a Linwood child might describe the flowers on top of the mobile as cotton and we really wouldn't know what the child is talking about until we let him guide us to the mobile by touching the object he calls cotton. From there it would explain the differences between cotton and paper by letting him feel the objects and make flowers out of the cotton, perhaps, three of the same little designs. Then he would have the experience of identifying them at a distance and distinguishing the cotton from paper.

Written Descriptions of a Brief Interaction Between Jeanne Simons and a Child. An important element in the training procedure is observing the children's behavior directly. The procedure was a group exercise in which approximately four therapists observed Jeanne Simons deal with a child for about two minutes without any explanation or collateral description of what was taking place. Each student, with pad and pencil, was instructed to write down everything that they could observe. Then they refined their notes to describe to the group what they had seen and what had happened. Each student supplemented the other's observations and Jeanne Simons finally filled in those events which everyone had missed. Finally the observations were put into a longer-term clinical context.

The inability of most staff members to notice many significant events and to describe the interaction objectively confirmed the need for this kind of training. (1) Each staff member was only able to record a small part of the events transcribed and there were even some contradictions from one staff member to the next. (2) There was a tendency to use subjective interpretive words such as, excitement which prompted questions like "what behavior did you see that made you describe this as excitement." Rather than recording "excitement" you should note that she jumped up and down, clapped her hands, laughed, and so forth. (3) The therapists needed to develop a shorthand for writing observations sufficiently. (4) Most staff members lacked a clinical framework which allowed them to note categories of behavior which they should be attempting to observe. For example, if a staff member was unable to notice whether or not there was eye contact between the child and Jeanne Simons she should be aware of the omission. (5) It is impossible to record in literal detail all of the events in an interaction lasting as little as even 2 minutes. Many of the observers simply guessed at the events rather than limiting their observations to the events which they had clearly seen and remembered. (6) Many staff members had a tendency to make inferences about the child's conduct which were unsupported by the underlying observations. For example, several said that the child "knew where the box of candy was" and could not state the data from thier observations which led them to say this. The discussion emphasized the kinds of evidence which were available in the two-minute period which would allow one to say with some assurance that the child knew where the candy was.

Toward the end of the discussion there was an opportunity for practicing technical behavioral language using the content of the preceding episode. Jeanne Simons asked the staff to identify some of the reinforcers which followed the child's behavior. One therapist identified a chain of performances and accurately described the intermediate conditioned reinforcers. Jeanne Simons discussed the process of successive approximation of the child's speech and discussed the criteria for determining how much she could require for reinforcement of the verbal performance being dealt with.

Finally Jeanne Simons described some of the reasoning which guided the design of her interaction with the child. She described to the group how she did not come into the situation with a preconceived decision as to what performance to reinforce. Instead, she set up a situation in which she could observe the child's reaction to several objects and several items of her behavior and find from them something the child is inclined to do or not do. She also discussed the problem of determining the rate at which one should require new behavior from a child, and the dangers of communicating demands to a child that he may not be able to achieve. By observing the actual behavior of the child it is possible to leave the pace of development to the child. Otherwise, if a large new requirement is imposed each time the child makes progress the therapist may, in fact, be punishing the child for achieving a new repertoire.

Memory. Another procedure is designed to teach students to remember the details of an interaction that has been observed. The student and instructor together observe a child for one or two minutes following which they both write an objective detailed account. The instructor's account serves as a model and as a differential reinforcer for the students' observations. Successive experiences of this kind are designed to provide a steady pressure on the student that will lead to accurate observations and recall. The principle is similar to that of the interview procedure reinforcing the study behavior with the text. Those activities while the student is observing the child which lead to retention and fluency about the event are reinforced when the student can later write and speak about what had happened.

After the student completes his description of the event he has observed, the description serves as a basis for a discussion with the rest of the group. We judge that memory for details of conduct is a critical tool for the mental health specialist because the significance of any item of behavior comes from a comtext of many past observations which gradually form a pattern.

The observations which were recorded during these periods also served as data to document the changes that were occurring in the children. To this purpose, each staff member observed some child he was not currently working with.

Written Descriptions of Therapy as Teaching Materials

Textual accounts of therapy such as those described in Chapter 4 proved valuable as opportunities for the students to practice the language of Behavior Principles and to apply the therapeutic content to their own experiences. The two examples listed below show how a direct description of a child was used as a formal exercise in the training program.

Miss E. has been sitting on the floor talking with 5-year old Brad while he's been block-building. As lunch time approaches, Miss E. instructs Brad to put the blocks away. Brad quickly replies "no" and walks away. Miss E. Follows him, firmly shakes his arm and says, "Go get those blocks picked up, right now!" Brad returns to the block area and puts the blocks away.

Analyze this situation using the terms in Part IV, Chapter 5 of Behavior Principles.

The setting is a fourth-grade classroom during a general study period. The procedure is that as students complete an assignment they take it to the teacher for an "ok" then they move on to a new project.

This particular situation involves Larry who has completed several assignments and now goes to Miss E. for another check. Miss E. however, is conversing with a staff member who has stopped by. After several minute, Larry begins to whisper to a boy near Miss E.'s deak. She asks Larry to return to his seat and he complies.

Using the table on Page 197 of Behavior Principles, identify the following for both Larry and Miss E.

1. Positive Reinforcement
2. Aversive Stimulus
3. Punishment
4. Negative Reinforcement.

Role-Playing Demonstrations by Jeanne Simons

An important technique, particularly for the conveying the practical content of the day-to-day therapeutic activities of the children occurred in group sessions in which Jeanne Simons and the Linwood therapists acted out the parts of a child and therapist. Very specific activities such as working with a puzzle or cutting with scissors were studied. These experiences had the advantage that they slowed down the therapeutic processes so that they could be considered in small detail and that the student had an opportunity to repeatedly practice the actual performances he would need to engage in were he actually doing therapy. Finally the experience of taking the part of the child frequently gave the staff considerable empathy and understanding of the child.

Instructional Session with a puzzle. Five therapists with a wide range of experience and education took part in the session. The first part of the meeting was devoted to the observation and description of the puzzle itself. The students actually wrote out descriptions and a complete account of the puzzle emerged from the combined descriptions of the whole group. It was an eight-piece puzzle of a duck on a blue background. The bill, the feet, and another piece were yellow; the rest of the puzzle was white with white markings. The pieces were irregularly shaped, differed from piece to piece, and the surface of the puzzle was smooth. The pieces were made from quarter-inch wood which made a noise when they touched the table or dropped into place.

Jeanne Simons first stated that the individual parts would not be recognizable as separate body parts to most of the children at Linwood. She then handed the puzzle to Mr. H who was to play the role of the therapist while she played the part of the child. When Mr. H took all of the pieces of the puzzle out of place, Jeanne Simons stopped him before he could go on and asked Miss B. to take the part of the therapist. She took only the bill out of the puzzle and holding her one hand over the rest of the puzzle, she put the bill into Jeanne Simons's (role-playing the child) hand. Jeanne Simons was satisfied with this as the opening technique and all the people in the group took turns demonstrating how to proceed this far. She then proceeded to demonstrate how to provide collateral support for a child who had very little initiative to get the bill into the opening. This was done by placing the missing piece next to the hole in which it fit in the proper orientation, taking the child's hand loosely and pushing the piece into position. Thus, the minimal level of involvement was one in which all the child was required to do was that he hold his hand in a relaxed position and remain in this situation to have the experience of the piece clunking into place completing the puzzle. The next demonstration considered the task of a child who could face the problem of picking up a piece that was upside-down. The common denominator of all the ways in which one could handle a child picking up such a piece were procedures for supporting the child either verbally or by manipulating the puzzle piece so that the child got it into the proper opening easily. In one case, for example, she simply turned the puzzle piece over while it was motion in the child's hand toward the puzzle.

By the time the child got to the puzzle it was in the right direction. Once again, each of the therapists had a chance to practice the various ways of giving the child the collateral support for getting the puzzle completed.

In the next demonstration Jeanne Simons took the duck's feet out of the puzzle in addition to the bill. Later, on the assumption that the child had made considerable progress, she took two pieces out at once and demonstrated a technique of covering up the inappropriate opening as soon as the child grasped one of the pieces. She showed the two stages to this manipulation: in one the pieces were lined up on the puzzle next to the appropriate holes and in another the pieces were at opposite ends of the puzzle so that there was no spatial clues as to which piece went into which hole. Once again each staff member had a chance to role-play the outcome under these conditions.

In a final demonstration she asked the staff member who was playing the role of the child to be purposely difficult to demonstrate how to deal with the more usual circumstances that one would encounter with the Linwood children.

A second session with three other therapists covered approximately the same ground and showed the same kind of difficulties. Each therapist when given the puzzle the first time, emptied all of the pieces rather than using one simple missing piece to allow the child to complete the puzzle on his first try.

One particularly instructive interaction occurred when a therapist defended the practice of beginning with all of the pieces of the puzzle at once. Jeanne Simons demonstrated the difficulties of this procedure by taking the part of the child and wandering around the room while the therapist set up the puzzle. As soon as each of the puzzle pieces was carefully lined up around the appropriate part of the puzzle Jeanne Simons, in the part of the child, came over and dumped them on the floor. The incident appeared very realistic to all of the staff members who had considerable experience with psychotic children and was a vivid demonstration of the necessity of carefully limiting the child's structured environment particularly when the repertoire is small or when the child is not familiar with the task.

Discussion on cutting paper. A similar group meeting was held in which Jeanne Simons demonstrated how to teach a child to cut paper with a scissors. The following text is an edited transcription of the actual meeting. The students and Jeanne Simons took part in playing the roles of the child and therapist as in the preceding account. Jeanne Simons first allowed one of the students to attempt the demonstration without any instruction from her. The role of the child was one who had never cut paper before. She then demonstrated the proper technique for supporting a child as he cuts paper for the first time and allowed the students to imitate her one by one as she pointed out the way their performance deviated from the one she was modelling. During the entire session each student had many chances to practice. The general technique she was demonstrating was a way of putting a hand over the child's so that the therapist could keep the child's fingers in the scissors as well as operate the child's scissors for him. At the same time he could feel the child's movements so that as the child began to close the scissors to any degree the therapist could withold his support in favor of the child's action. The interaction is best described on a video tape but the following account gives some of the flavor of the interaction.

Jeanne Simons: Wait a moment. Miss M show Mr. P what he did. So you see the disadvantage of cutting like this... Let's get this off of here. See if you hold it, most of you hold it like this. Now, look what happens, you have nothing to help you. If you hold it like this, you--between your finger and thumb, don't forget children's hands are small and it is much harder. Now, if I do this, you have to start all over because you lose it. I look for how I use my fingers with those fingers I can open it and close it. Open. Close. I can do it for her. With those fingers here, I can hold the scissors straight, if I have to. If you hold your paper here, you can try this. Hold your paper there and you don't do anything with your fingers. You don't have to. If you hold it here, you have your whole hand.free and you have the next one. In order to be... you can put your finger between. So you use all of your finger. What is another advantage of holding--you try it. You try to teach Miss M. All over again, from the very beginning. Now you know that she is right handed.

The details of such a simple operation as having a child succeed in cutting paper was so complex that over an hour was consumed in each member of the staff taking turns and practicing. Each of the errors that the students made in controlling the child's cutting behavior provided opportunities for pointing out the critical aspects of the procedure. The student playing the role of the child also varied their behavior and acted in some of the difficult ways that the schizophrenic children sometimes do and thereby provided other means of highlighting the special features of the procedure which were critical.

Video Tape Recording

The video tape recorder provided an opportunity for the student to view the child's behavior at any convenient time, alone or in a group, and under circumstances where he could look at a very small sample of behavior repeatedly until he could observe all of the details. A library of tapes contained a permanent collection of behavioral transactions which could be repeatedly used for a wide variety of teaching purposes. A student, for example, who wanted to practice the very difficult and delicate manipulations involved in teaching a child to cut with scissors could repeatedly view a video tape while he practiced with another staff member progressively mastering the delicate manual skills that were involved.

The following text describes the content of a video tape so that the reader may have some idea of how these tapes were actually used for instructional purposes and the kinds of materials that they contained.

Textual description of the video tape. Jeanne Simons placed the ball in the cupboard and immediately placed a key ring on the table in front of Kent. He reached for the keys and touched them, and picked them up. Jeanne Simons had a piece of cooky in her hand and opened it so Kent was able to see the cooky. At the same time she requested that he give her the key. She repeated this two or three times while Kent continued to handle the key ring during which time he vocalized rather softly and then tried to pull her hand open with his fingers. Jeanne Simons kept her hand closed and Kent continued to handle the keys, dnagling them and tapping the table with them. Jeanne Simons softly began to say "Click, click, click" in rhythm to Kent's tapping the table. She repeated this along with the tapping three or four times, then moved her hand right under the keys which he was dangling, saying "Give me the keys." Kent then released the keys into her hand and she opened her other hand which had been holding the bit of cooky and accompanied it with, "Very good, Kent." The procedure was again repeated after Kent's failure to react to the two or three verbal requests to hand her the keys. Jeanne Simons moved her hand close and he again released the keys into her hand.

Jeanne Simons then commented that she was going to make it a bit more difficult and returned teh ball to the table in addition to the keys; so there were now the two objects--the key ring and the ball--on the table before Kent. She asked if he would give her the key and he began to push the ball back and forth gently on the table using the key as a pusher. He then tried to open her hand containing the bit of cooky. She kept her hand closed and very soon Kent gave her the key, by placing it in her opened hand which was near the body. Jeanne Simons then placed her hand on the key ring asking that he give her the ball which he once again began to roll back and forth on the table. Jeanne Simons left the bit of cooky on the table and opened both of her hands near Kent as if to catch a ball. He very quickly reached for a bit of cooky and she covered it with her hand repeating her request that he give her the ball. He pushed the ball toward her and she immediately commented, "Very good, Kent," and took her hand off the cooky which he very quickly picked up and put in his mouth. Jeanne Simons continued the ball and key activity for a few times and when Kent handed her the incorrect object she would withdraw her open hand and immediately repeat her request for the other object.

After Jeanne Simons and Kent had been engaged in the key-ball activity for a while and Jeanne Simons evidently felt that it had been enough time she gave him a cooky saying, "That was very good," and leaned toward him, cuddling against him by putting her arms around him and her head near his. Kent gurgled similar to the sound a baby would make and didn't pull away from her body and smiled.

Group discussion about the video tape. After the students viewed the video tape a group discussion was carried out with Mary Carol Perrott and Jeanne Simons in which the students discussed the gross features of the interaction. During the discussion those parts of the tape were replayed where the students were not able to remember what had happened. A transcription of a small part of the discussion follows below.

(MCP) Who remembers what we were looking for last week, what the specific behaviors were the we were watching for? LONG PAUSE...Nobody remembers? (Mrs. O) Kent wanted a cooky, so that's why he tried, for instance to put the ball in the box, but he looked in the box. (MCP) And what else did he do? (Mrs. O) He just looked for the cookies. (MCP) How do you know he is interested besides the fact that he looked? What else does he do? (S) He ate. (MCP) He ate the cooky, what else did he do? He looked at cookies, he ate cookies, and what else did he do? (S) He reached for a cooky. (MCP) OK, he looked, he reached, and he ate cookies. We noticed that the last time. Do you want to look at a little bit of that again now? We are all kind of tuned in to the same wave lengths. Let's watch his left arm in the back, it's in back of the screen and it is kind of waving around like this and you'll see Miss Simons's hand. Let's watch the reaching this time. (Video recorder played here.) (MCP) Would anyone else like to guess what is going on there? Now we noticed that his left arm was moving around, what else do you think might be important? (S) Kent tried to use his left hand to get in the box, maybe trying to ask Miss Simons for a cooky or... (MCP) Do you think his left hand? What is happening with his right hand? (S) He uses that to bounce the ball. (MCP) OK, how was he playing with the ball at the beginning? (S) He was just rolling it and his hand is on the ball. But there is no bouncing. He was just getting the feel of it. (MCP) What does someone else think of it? (S) He thinks there is too much there to hold. (MCP) Then what happens? (S) I don't know, he just grabs the ball more often than he did before. (MCP) OK. Let's watch the ball playing and see what is going on with that ball. (Video recorder played here.) (MCP) OK. Did anything change from the beginning until right then in those 20 or 30 seconds? (S) I noticed that from the beginning Kent sort of rolled the ball as Miss Simons told him. He felt the ball the second time, not the first time. (MCP) OK. Let's look at that again. (Video recorder played here) (MCP) Notice where the ball is now. (S) The ball was on the table in the beginning and he didn't pay too much attention to the ball being there and... (MCP) What did he do? (S) He got a cooky... (MCP) Wait, what about the very beginning? She said the ball was on the table but he didn't pay too much attention. (S) He was anxious to get a cooky. (S-1) Miss Simons had the ball in her hand.

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In general, most of the Linwood therapists, before they had experience in the detailed description of behavior were not able to see the delicate features of the child's behavior. The preceding account illustrates the way in which the video recorder was useful in teaching these staff members to observe a very small sample of behavior in very great detail by repeatedly replaying a small part of the tape until they could say something appropriate to each tiny feature of the interaction with the child. Although these child workers who took part in this particular discussion were less able verbally than most of the Linwood staff, their performance in describing this tape was not markedly different from some of the therapists with more academic training.

General procedures for using the video recordings as teaching materials. The preceding transcriptions of students' description of the video material illustrates how difficult and complex the task is. The use of the video tape recorder as a teaching device, therefore, requires successive approximations to the final complex descriptions which the student is eventually required to make. While there was not time during the final stages of the training program to completely develop explicit textual materials to go along with the video tapes, there was enough experience to develop a general format. The instructional plan that emerged was one in which the student goes through each video tape in !rogressive detail and at different levels of abstraction.

1. In a first level of description the student is simply asked to describe the gross performances and characterize the situation generally. The following account by John L. Cameron is an example of a first level description of a tape describing Jeanne Simons interviewing a child during his first visit to Linwood.

The session which is shown in this first piece of video tape is an initial interview between Jeanne Simons and Kent. Consequently it can best be regarded as a diagnostic type interview in which the therapist is carefully evaluating the child, the child's behaviors, the child's disposition, and her own ability to interact and reinforce his operant behavior. The procedure can be noted by reviewing this entire film as one can see the therapist's posture gradually shift as she makes a functional analysis of the situation. The predominant change that occurs in the therapist is that as she notes the child's tendency to emit certain behaviors she then gets behind him as it were and by a simple process of reinforcement increases the frequency of these operants. The operants with which she finally works are his tendency to handle the ball and a key, and she very smoothly and rather simply reinforces the handing of these articles to her on the appropriate occasions. It is noteworthy, for example, that initially she places the cooky which she is using for a reinforcer inside the box so that in order to reach the cooky he puts the ball into the box. However, she observes that once he has the cooky in his hand his disposition to indulge in any other activity ceases.

2. A second level description. In this next level of description the student is required to identify specific features of the conduct of the child and therapist and the relation to each other using some of the behavioral language to point out the major behavioral processes that are exemplified. The following text illustrates this level of description. The numbers indicate the footage on the video tape.

(201-208) The first behavior reinforced is taking the cooky out of the box. The sequence was as follows: Miss Simons placed a cooky in the box then she placed one hand on the ball, Kent simply left his hand in place--he didn't grasp it. Then she put the other hand on the ball and then with both of her hands around his hands, she carried his hands over on top of the box and released him so the ball dropped in the box. At this point she let him reach into the box for the cooky which he took out and ate. So the net result of this episode was that the behavior of reaching into the box for a cooky was reinforced by getting the cooky and the occasion on which this was possible was when the ball was in the box.

(208-213) Note that Kent is emitting some behavior reinforced by the ball itself. He grasps it, holds it, and rolls it around.

(214) Kent reached for the key and Miss Simons prevented his grasping it. This is an example of unreinforced performance, but she also reinforced verbally by the reply "That's the key," as she takes it away. She really doesn't want to lessen his interest in the key since at a later point she will be concerned about his handing her the key. This probably accounts for the verbal reply to him.

(218) Kent continues to be controlled by the ball and Miss Simons's prompts are unsuccessful. Note how she minimizes the amount of behavior required to get the ball into the bowl. Note her controlling his looking at the bowl by dropping the key in. The ball enters the bowl finally by Miss Simons tapping his hand when he has the ball near the bowl. Note also, how she engineers the situation very carefully so that she could be in a position to tape the ball into the bowl. Under other circumstances it might have been necessary to have a fight with Kent to get the ball away from him to get it into the bowl.

(218) The performance reinforced is taking the cooky reinforced by eating it. The behaviors described so far may be compared with the training of the pigeon to eat from the grain feeder. The conditions under which Kent was eating his cooky twice in a row involves the ball in the position that Miss Simons indicated. Note also, that the only behavior Kent was allowed to engage in, was closely correlated with Miss Simons's verbal statements. That while she was mentioning ball at a high frequency the performance controlled by the key was not reinforced by any tactual contact with it.

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(222) Here is an example of non-reinforcement. The cooky in the bowl is controlling Kent's looking into it and reaching toward it. Behaviors on other occasions would have led a similar person in similar circumstances to either allow him to grasp the cooky or would have resulted in their handing it to him.

(228) Kent is rolling the ball, Miss Simons assists him to put the ball into the box whereupon he removes it and places it back on the table. Kent's behavior at this point is clearly controlled by the ball in his hand and his own motion of rolling it. His removal of the ball from the box clearly demonstrates this point. In this particular situation the therapist has used this tendency on the part of Kent to handle the ball to increase his behavior so that he reaches into the box and removes the ball from there. Karen on the rocking horse is another parallel example. The student should read this account and describe Karen's behavior in taking the doll and Miss Simons's arrangement of this reinforcement in the same terms as in this video strip.

(231) Kent is rolling the ball, Miss Simons uses his tendency to handle the ball and his interest in eating cookies to combine the two and produce a new piece of behavior, namely, handing her the ball. So that by handing her the ball he then holds the cooky in his hand which he then eats.

(233-234) You will notice an increase in Kent's frequency of handing the ball to Miss Simons and her immediate reinforcement of that operant with the cooky. Subjecting this to a rather final analysis, the actual reinforcer on this occasion is a conditioned one--namely the sight of the cooky in Miss Simons's hand. This can be compared to the pigeon experiment where the sound and the light and the food magazine are the conditioned reinforcers for whatever operant has just been emitted.

3. The next level of description is a functional analysis of the behaviors on the tape emphasizing a more continuous description of the child's activity. The text below illustrates this kind of description.

The first part of the tape deals with the reinforcement of reaching into the box by a cooky. When Kent first sat at the table, there was no behavior under the control of the cookies, the box, or the ball. During the course of the first episode look for two instances in which reaching into the box was reinforced by receiving a cooky. Note the resulting frequency of Kent's left hand moving in the direction of the cooky and his glancing at the place where the cooky is, and note that every time that Kent receives a cooky the ball happens to be in the box. The parallels to be drawn here are that of magazine training. In the course of training a pigeon an almost identical procedure occurs as the feeder is opened so the bird can eat. However, the feeder or when the feeder is open there is always a characteristic stimulus, like a light or a noise which signals when the grain can be reached. When this magazine training is first begun, there will be a general increase in the frequency of pecking at the place where the grain is. This pecking, of course, goes unreinforced except when the magazine light and sound are present. In the case of Kent we have the increased frequency of reaching into the box for a cooky as a result of Kent getting a cooky when he reaches into the box, but the specific occasion on which Kent finds a cooky is both the ball in the box and various other personal signals which Jeanne Simons gives. The next part of the tape up to the point where Jeanne Simons takes the box away continues the same behaviors under the control of the cooky. There are two more instances in which reaching into the box is reinforced by the cooky. There also is a continued frequency of moving the left hand as well as looking to the place where the cooky is. Also to be noticed at this point, although in the first instance the ball did not control any behavior, now Kent is bouncing it and holding onto it. Note also that holding onto the ball is a performance. Note that Jeanne Simons continued to give cookies to Kent only when the ball is in the box. Note that Kent is actually not putting the ball into the box. It would be incorrect to describe Jeanne Simons as "helping Kent put the ball in the box." She is actually pushing his hand which in turn pushes the ball.

At the very start of the episode the ball controls very little behavior. Jeanne Simons wraps Kent's hands around the ball and as a result of this contact he begins manipulating it. This behavior maintains a quite high frequency of discrete performances reinforced by their effect in the tactual reactions of the ball, the noise it makes, or its change in physical location. The delivery of the cooky is very closely associated with the position of the ball.

The ball fell into the box from Kent's hands five times. The first time he had the ball in both his hands and he simply released it. As soon as the ball fell in the box, she allowed him to reach for the cooky. The second time the ball dropped in the box, Kent had been manipulating it and bouncing it. Jeanne Simons used his hand somewhat in the manner of a piece of wood--she used his hand to propel the ball across the table into the box. Following this he was allowed to reach into the box for a cooky. The third time the ball fell into the box, it fell in perhaps accidentally because the table sloped and it simply rolled across the counter into the box, when Jeanne Simons released it. On this occasion no cooky was delivered. The fourth time the ball got into the box, was the instance when Jeanne Simons began with the "cheep-cheep." Although Kent's hands were touching the ball just before it dropped in, no cooky was delivered. Notice on this occasion Kent is looking in another direction. The fifth time the ball wound up in the box, it occurred because Jeanne Simons took Kent's left hand, moved it behind the ball and pushed it against the ball in a way to make it drop in the box. On this occasion she let Kent take a cooky out of the box.

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The next thing that happened in the film is that Jeanne Simons removed the box from the table. We would now like to refer back to the events which led Jeanne Simons to do this.

At this point review the film again and watch Kent's behavior when he has the ball in his hand. Note that almost all of the performances controlled by the ball involve holding it close to him, manipulating it in front of him. There is no indication of any behavior which shares any of the topographies or function of throwing a ball, pushing it away, letting it roll or any of the things which would share some of the topographic features of putting the ball in a box.

4. The final level of description is clinical. The following text illustrates some of the clinical content associated with a brief video tape of a therapy interchange. The child is the same one that was described in the previous tapes but the episode occurs a few weeks later.

(JS) He had to fill in the blocks, each cylinder has a different width, but they are all the same depth. I really tried to see if he'd perform and what kind of perception he had. I'm still using little pieces of cooky. I took out the first few cylinders and he immediately continued putting them on a straight row. I immediately turned the cylinder around to see if he had any concept of where they belonged. He promptly got them in right. I want to remark here later about compulsion. Notice here the one he skipped. Also, about negative behavior. As he did it so well, I tried something I would ordinarily not do. This was a complete, different size with different depth. He was immediately aware of the difference in depth. Now, watch carefully in what you see next. It may have something to do with the relationship. I would like to put the impression here of what is the child aware of. He can take my hand so I can be aware again of negative behavior. I would like to change the word negative to stubborn. The youngster now works a long time without wanting or being aware of getting a piece of cooky. A cooky is offered without his asking it. He is obviously not distracted with the observers who are in the room

(MCP) Kent was wandering about the room and looking at furniture, but wasn't going to any of the people that were standing about in the room.

(JS) When he opened the door, although, Mrs. N was close to it. At no time did he take her hand to do it for him. While I was with him, he took my hand to go to the cylinders. We may say something later about the forming of the relationship that's going on and different associations with other people.

(MCP) Jeanne Simons is now playing with Kent with the ball and the cottage cheese container. There's a cover on the table.

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(JS) Through the sounds he makes, you get a feeling that he objects to it that he's not particularly pleased by doing it. This is something again about stubbornness which I kind of like in him. Watch the puzzle now and how little he is asked to do. This is not the first time he has done the puzzle. Observe how I hold my hand and so he doesn't get distracted by all the other people. Although he had done it before, it would have been better if I would have taken some of the tops and some of the bottoms and left the middle part all together. I tried as much as possible to let a youngster to come back by himself and be very patient and give him attention.

(MCP) We are now on the section about Kent that was recorded on May 3, 1967.

(JS) It's obvious that he can take changes. The cylinder is now in an entire different direction but he is not compulsive about it. Observe how the child helps to turn something around or I help him turn it around.

(MCP) Jeanne Simons is working with Kent on the duck puzzle.

(JS) Kent does not seem to be distracted by the other cylinder and the colorful puzzle. The span of attention is fairly good. He makes several trials putting a cylinder on an opening, selecting carefully the right one. He probably knows exactly where it fits, but he's going to try everything to put it anywhere else--again stubbornness. He uses both right and left hand.

I'm playing with Kent on the floor, and he puts the ball in the cup. He's very slow at doing it, but obviously knows how to do it and I spent quite a bit of time. I am waiting here for sounds. Jumping up and down is the real reinforcement for the slightest sound he gives. As time goes on, I am waiting for a clear sound.

(MCP) Two weeks later on May 16, 1967, another discussion of Kent.

(JS) Kent may give the impressions to observers that he's not as interested. I think there's something else going on. I had the feeling the youngster is aware that demands made upon him and he's going to fight. Again this is an indication of a very stubborn child. Observe how Kent is restrained without actually being made immovable. In order to keep him a little bit to himself.

(MCP) Jeanne Simons has gotten down two sets of Montessori cylinders again. The coloring is still on the table and so is Kent too.

(JS) I take the cylinders out of the form and instead of putting them in a row, I mix them up. I wanted to see if Kent really would try to fit in half of a cylinder block. He immediately took out the ones that were left and had to have the cylinder blocks empty before he started to put them in. But he was perfectly willing to have them mixed up. He didn't seem to object to that. I, again, took that one piece out of the other cylinder that on two weeks ago he had very reluctantly put in and made a kind of angry sound about it. I keep turning the order of the cylinders and he acts as if he were unaware of it. He certainly does not object to it. Watching it, Kent gives the impression as if he has more difficulty in putting the cylinders in than he had the very first time, and I don't think this is true. As he had failed to draw, I put him back on something I was sure he could do and be successful at it.

(MCP) Now there is a truck on the table and Jeanne Simons has just taken a piece of cooky in her hand. It's a new activity. Kent has never played with this truck before.

(JS) He has never ridden on an object. What I'm really asking here is that he is to roll the truck toward the cup. Instead of having the cooky on the table, it's in the cup. So it's a little bit more difficult to get it. He seems more interested in the cooky today than he was two weeks ago. Rolling the truck is similar to rolling the ball. The pieces of cooky are so minute. I don't think they are a quarter or a fifth of an inch. I'm comparing the ball to the truck. Both things can roll. The piece of cooky is in the truck. An activity with the ball is necessary for him to get a little cooky.

(MCP) Now Jeanne Simons changes to the duck puzzle and removes the truck and ball from the table.

(JS) The part of the puzzle that I took out was upside down, and this time without any hesitation he turned it with the color up and put it back. The youngster had been fairly familiar with the ball. I just tried using it in different ways. Putting it in the box, or rolling it, or tapping it up and down. I have added the truck. He doesn't seem to get the connection between rolling the truck and rolling the ball. He pays much more attention to a possibility that there is a cooky somewhere.

The Student Views his Own Performance on Video Tape

A video tape was made of a staff member working with one of his children to illustrate a particular stage of his therapy activities that he wished to present and discuss with Jeanne Simons and the rest of the staff. The text below contains Charlotte Farrand's summary of the outcome of such an experience with one of the Linwood therapists.

The therapist chose an autistic boy who has just started to speak occasional words and repeat things he heard. She chose to film a five to ten minute period in which he worked with a device with four windows thatcould be opened by remote buttons which she controlled. Each time the boy said something she could open the window so that he could take out a toy, a piece of candy, or some object from behind the window. Both the therapist and the instructor had observed the video tape separately. Charlotte Farrand's comments follow:

"I decided not to discuss the video tape with M because I wanted her to see it by herself and see if she could find her own mistakes and areas where she could improve. If a staff member could discover their achievements by themselves there is the double gain of an increase in confidence as well as the improvement in technique. When asked about what she had gotten from the tape she replied that her main fault that she observed was too much speaking. She remarked how nervous she was being recorded on the video tape and how clumsy she felt in her work.

As a result of M's experience in recording the video tape with the incident was replanned and carried out a second time. The result was a marked improvement both in M's performance with the child and her ability to observe and comment on what had occurred. She was considerably less tense and anxious and spoke much less during the episode. Her general posture during the interaction with the boy changed as she remained a greater distance from him and was able to pause at the appropriate times waiting for the child to exhibit his conduct before reacting to him. Herdescription of the tape when she subsequently viewed it was in considerably more accurate and in great detail.

These self consciously filmed episodes of their own therapy with the children had the following advantages for the student-staff members: (1) Composing and defining a situation which they would film gave them practice in formulating behavior technically. (2) The discussion of the therapy episodes increased the interactions among the staff members who expressed and contrasted different points of view and interpretation and compared their own program with their own children. (3) The emphasis on evaluation was focused on the student who was encouraged to describe his own behavior in detail rather than to depend upon the director. (4) The students became aware of some of the ways in which they lacked therapy skills and therefore attempted to find ways to enlarge their capability by various kinds of supplementary experiences.

Teaching psychoanalytic concepts with the video recorder. The development of video tape materials did not reach the point where there were formal textual materials that would pace the student's interaction with the video tapes. The following textual materials, however, were designed by John L. Cameron for teaching Georgetown undergraduate psychology majors to identify the major dynamic mechanisms and the highlights of a psychoanalytic hour. The student was asked to view the tape twice; first, to observe the gross features of the interaction and second, to start the identification of the processes occurring in that particular psychoanalytic session. These texts provide a partial model of what could be done to present some of the video tape teaching materials more formally than was done in the preceding examples.

Instructions for Viewing Tape

Observers viewing this tape should remember that they are able to do so by permission of the patient. He has released this highly personal, confidential material for scientific purposes, and also for use in the education of his fellow psychology students.

Viewing

View the tape from start to finish in a situation in which the observers are not distracted. Observers should not discuss or comment upon the session, as it will distract them. On the second viewing, set the calibrator 000 at the point at which the patient states, "I was talking about my roommate, and those two other students." Use the rough thematic guide which is supplied. Pay attention to his posture and movements as well as to the nature of his speech. Watch for changes in speed in his speech for slurring and alterations in clarity, and note where silences occur. Observe the frequency of questions. By calibration 052, the theme of the session should be clear, and consequently the analyst's activity is self explanatory.

Note the analyst's attitude. Although he answers the occasional question in a rather neutral way, note how often he turns the questions back to the patient. Most of his activity is to seek clarification at some point. You will observe that even when he is making an analytical interpretation, that it is nonetheless rather tentative and questioning. The denoument of the session follows the intervention at 438.

000	"I was talking about my roommate, and those two other students, you know."
004	He questions the nature of friendship, and it includes a reference to suicide.
016	His friends are critical of classes.
032	He quotes them as regarding psychology and Rorshach Tests, as subjective and meaningless.
046	They are critical of psychotherapists who only go ah-huh, ah-huh.
051	Note his questioning.
052	He defends psychotherapy. Note his reference to being crazy.

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060 The session is interrupted by a staff member of the University. This is an almost unheard of event in private practice.

062 He continues his discussion, but note that it has shifted much more to psychology.

081 He again quotes his friends as being critical of psychotherapy.

086 He defends psychology.

095 He repeats his arguments with his friends.

112 Interruption caused by movement in the recording equipment.

120 Note the discussion of the income of psychologists.

132 Note the argument against the apparent cause of his insecurity. Psychologists have a good income, are helpful to man, and have special skills.

145 In discussing narrow-mindedness, he equates this with opposition to an experimental approach.

153 The analyst's comment here is the standard request that the patient commence to examine his thought content.

155 The patient's response is an almost rule of the thumb generalization which he produces regularly. It is correct, but irrelevant.

160 Note the reference to quackery.

162 A repetition of a request for the analytic posture. The patient again does not respond.

181 He stresses that in his training he has received knowledge regarding the importance of the practical world of finance.

192 This analytic intervention is closer to an interpretation. Note how quickly the patient contradicts it.

197 Notice his description of his problem of dependency.

223 In describing his interest in reading, he emphasizes that it is for his personal entertainment and not designed to impress other people.

236 Note his silence.

249 The story which he now tells is quite revealing. Note how quickly he assumes responsibility, and assumes somehow that he is at fault.

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274 Note his protection of his friends.

281 He produces a barrage of questions.

295 An analytic-type question.

296 Patient responds, again, with generalizations.

302 He is silent and pulls pieces of rubber off his heel.

316 He is talking of intimacy.

321 Analyst draws attention to the imporsonal nature of the account. Note that the patient explains it away.

396 He is still pulling at his shoes.

400 He explains his uneasiness.

411 The analyst asks if he wishes to see the film. In the discussion of this he spots his dependent operation. He prefers to continue with the treatment.

434 He discusses why his friends' critical comments make him uneasy.

438 Analytic clarification.

439 Patient confirms clarification.

446 Analytic interpretation of content.

455 Patient's response.

Instructions for Second Viewing Period

In psychoanalysis a concept of very considerable importance is that of the defence. For the purposes of this study the instructor proposes that a useful exercise is to regard the analysand's avoidance of the development of the theme discussed last week as an aspect of his defensive processes. In considering this rather complex matter, it is important to keep in mind certain nosological considerations which have been attributed to him. For example, he can be regarded on the basis of the best expert opinion available to us as a convalescent autist. Autistic people can be regarded psychogenetically as possessing mental functions of the most primitive nature. Consequently, in viewing the tape of this particular session, the students have a unique opportunity to see at their simplest, the processes which occur in the average analytic session.

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The concept primitive nowadays has a pejorative significance. It has no such significance in psychogenetic theory. It merely implies a historically earlier origin in the life of the given individual. Such activities may be compared to the simple tendencies displayed by an unshaped pigeon on the one hand, to the highly complex repertoires developed in such creatures as the result of the interplay between their operant behavior and the highly responsive environment. It is not easy to realize that in the historical sense, the pigeon that turns head over heels is doing so because of the interaction between his tendency to stretch his neck on the one hand, and the contingency of the environmental reaction on the other. However, the instructor is sure that you have seen this adequately demonstrated in the course on the fundamentals of behavior.

In the course of the session, almost every defensive process in psychoanalytic theory appears. In particular, note the frequent appearance of displacement and condensation which are regarded as the primordial mental processes. One differentiation which is worth keeping in mind is that a process is merely a mental mechanism, whereas a defence has the additional purpose of diverting thematic development. You should note the blurring which makes it difficult sharply to discriminate between the defences. There are two reasons for this. The first is the psychogenetically simple nature of the analysand. The second is, however, that in most textbooks on psychology defensive processes are defined perhaps for pedagogical purposes as being more clearly delimitable and discrete than they are when observed in a natural situation. (In the modern world, the analytic situation is one of the many natural, if somewhat odd, situations which one encounters.) Notice, for example, how Danny's use of displacement slips from being a process to being a defence, and how the defence of displacement becomes also a repression. In the hour you can see why Freud called repression the most expensive of the defences. One can also see its close relationship to rationalization, and to that most troublesome defence called projection. Projection is a cardinal feature of schizophrenia, the mental illness which is responsible for the fact that twenty-five percent of all hospital beds in this country are occupied by mentally disturbed people. It consequently merits our attention. Note also the relationship between displacement and denial, a defensive process of central importance in manic depressive psychosis, another important and intractible clinical entity responsible for extraordinary distress among human beings.

One can learn a great deal by watching this session, keeping in mind thematic development, and defensive activity as a theoretical tool. Over and above that, however, there are certain comments which he makes which are of predictive value. For example, the analyst does not take lightly the patient's apparently casual remark that his friends would not be influenced even by his suicide. Should you ever be an analyst, what would you make of such a comment? What would you think about it and what would you do about it? Can you notice any other such comments in the session? Think about them, and bring them up for discussion in the class session.

Instructions for Viewing

On this occasion we are studying mental processes and defences. Calibrate the equipment as you did for the first session.

000-012 Observe the displacement.

014 He tries to get a lead from the therapist. This is the process of dependence.

014-018 He uses rationalization.

023 Note his contradiction of what he has said himself, in order to agree with the therapist. A dependent process involving the use of denial.

038 He attacks the "aggressor." In this case this is counterphobic defence.

042 Rational explanation of friend's conduct.

048 The use of humor--but remember Freud's paper on "The Wit and its relation to the Unconscious."

053 The defense of undoing.

057 Displacement of criticism of psychotherapy to "the field."

060 With interruption, note the disappearance of psychotherapy.

062-067 A counterphobic attack on his roommates. Note his own alliance with psychology. This can be regarded as identification with the aggressor.

067-073 Rationalization re psychology.

The mechanisms of defence to far include repression, denial, projection, and rationalization as aspects of displacement and condensation. If you have not observed the verbal behavior upon which these theoretical formulations are based, review the section.

106 Rationalization re sports. He is in fact acutely uncomfortable about the limitations of his physical incoordination.

120 Displacement and repression. Note the level of his speculation regarding Dr. Ferster's income. He personally pays the analyst the standard analytic rate.

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160 Note the dispalcement and repression in calling psychology quackery. The term 'quack' is usually reserved for dishonest members of the medical profession.

197 He expresses clearly his dependency. This particular type is anaclitic dependence, and its form is emotional dependence.

249-269 In this story, observe that he ends up concluding that somehow he is the cause of the disturbance. This is omnipotence. Of more ominous significance is that it is of depressive type.

281-293 In this series of questions, note that the patient is seeking a response from the analyst regarding himself--his own views are not adequate. This is an example of the dependency which he himself described. Note that in answer to the analyst's question, he responds accurately, but displaces outside the current situation.

321 Note the defensive function of the absence of names. He is not sufficiently interested to ask names--but he is sufficiently interested in people to be dependent on them. Hence the impersonal attitude is a defence against dependency.

361 Long, theoretical discussion of pseudo-intectual type. Note how far this is from the thematic content discussed at our last meeting. Recall also that he only knows three students by name in his university.

400 He accurately describes his conduct and explains it. Note, however, that he is still displacing outside the here and now.

The remainder of the student's experience consisted of class discussions where they tried out their descriptions of the therapy hour on Dr. Cameron. Further development of this technique would use more textual material describing the kind of things the student is to say while viewing the tape. The student's task would be to find the appropriate description to say at the appropriate parts of the tape. Successive tapes, similar in general content but different in detail, will require the student to make his comments with less support from the text.

Results of the Training Program

Student Behavior During the First Stages of the Training Program

Almost every student seemed to experience a plateau in the academic training program in which there was not only a slowdown in the rate of study, but also resistance to the course content. The plateau most often occurred following Chapter 7 of Behavior Principles which integrates the preceding chapters and sets the occasion for very different behavioral processes in the following chapters. The plateau suggests the need for the development of additional clinical materials to slow down the rate of introduction of new concepts and terms and increase in the immediate relevance to the student's current activities.

Self conscious use of operant language. All of the students seemed to go through a stage in which they over-used operant language, permeating all of their conversations to the point where some people found the jargon unpleasant. This use of operant language tended to be mechanical, self conscious, and very distantly removed from the delicate, fine-grain descriptions required for clinical phenomenon.

Operant conditioning as a technique rather than a means of understanding clinical methods. At first Linwood therapists applied what they thought of as operant methods as a rigid formula without the sensitive interaction with a child required by the therapeutic goals. Such rigid postures with the children occur with many beginners, however, and it may be that the beginning therapist uses any formulation mechanically. The application of rigid program schedules with the children frequently increased the amount of compulsive and other kinds of undesirable behaviors.

Imposing the therapist's motives on the child. The beginning therapist frequently carried his own motive to the therapy situation rather than observing the child and meeting his needs by reinforcing slight tendencies and preferences. The following example illustrates this stage that so many students go through.

> Mr. B had initiated afternoon exercise for the older children which were conducted in the hallway. The exercises had been very much under Mr. B's control and were carried on in the calisthenic tradition with everybody going through a specific series of exercises. He had originally felt quite good about the activity, but now felt that they were all wrong and the children really didn't like them. At this point he didn't particularly want to analyze the situation.

Misapplication of reinforcement analyses. Many students tended to apply reinforcement principles too generally without regard to the specific features of the particular situation of which they were working. For example, a reinforcer successfully used for one child would then occur frequently and inappropriately with other children. A single instance where a performance does not increase in frequency sometimes results in some tendency to reject the validity of the principle when the failure came from a misapplication of some of the collateral conditions which were necessary. The beginner frequently "aped" successful therapists and set up a whole series of activities for a child based on what he was imitating. Yet, the experienced therapist whom he was imitating arrived at the procedures step by step building on the current behavior the child was engaged in so that the activity was composed and tailored to the needs of the individual child rather than invented and applied as a whole.

Inability to defer reactions to annoying behavior. The beginning therapist is frequently overly reactive to the child's annoying behavior rather than attentive to the constructive features of the child's repertoire whose frequency can be increased. Such a tendency to react to the child's annoyances tends to increase the most primitive aspects of the child's repertoire. The ability to deter action in the face of an annoying conduct from the child represents "secondary process," in the Freudian sense, which depends on many complex ways of dealing with the child.

Increments in Staff Behavior

While no formal measurements by the use of rating scales, structured observations or examinations were used to identify the increments in the skill of a clinical staff, the following observations indicate the areas in which changes occurred and the kinds of changes which we saw.

Skill in observation. The ability to find specific reinforcers for specific individual children was one of the important ways in which the staff showed increased sensitivity in their observations of the child's behavior. The staff members began to notice, for example, that "Billy reacted positively to intense physical activity such as jumping or holding him in his arms while Becky responded to music on the record player." The following account indicates the kind of sensitive interplay with the children that began to emerge in the student-therapist.

> A child is squatting on the ground, eyes turned down, turning a piece of cardboard back and forth and upside-down. The adult sits beside the child on the ground but without touching him or saying anything. The child continues his activity with the piece of paper. The adults picks up a small stone and places it very gently on the paper, moves back a bit, but he remains close to the child. Without looking at the adult, the child tips the paper and the stone rolls off. After a few moments, the adult once again places the stone in the middle of the paper. The child repeats tipping the paper, this time looking at the adult. The stone is again replaced,and this time the child tips it more actively, looks more quickly at the adult and smiles. After this is continued several times, the adult places the stone on the ground close to the paper; the child picks it up and places it on the paper and tips it off.

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Progress in the training program was frequently indicated by more frequent and appropriate use of technical and precise language in the descriptions of the children and its potential effect on the therapy is reflected in the following comments by a staff member:

> Using therapeutic language in describing an observation of a child tends to change the child; operant language does not, because you only describe what the child is doing without labeling him. It forces you to observe the moment-to-moment interaction of the child with his environment, rather than broad causes. So you react to what the child does at the moment instead of as an "autist."

Quality of the interpersonal control with the child. Jeanne Simons identified many changes in the quality of control use with children. For example, the incidents of using the word "no" decreased markedly with the student's experience in the training program. One therapist in the discussion with Charlotte Farrand following an interview on the section in Behavior Principles covering the control of behavior by aversive stimuli made the following comments about a question asking for examples of aversive stimuli. "The therapist was interested in having the child put away the blocks. If the therapist used a rough tone of voice with the child this would constitute an aversive stimulus which the child would terminate by running away rather than handling the blocks. The behavior reinforced by the rough tone of voice would be incompatible with putting away the blocks. The constructive way to handle the situation would be to kneel down beside the child and interact with him as you said, 'Let me help you put the blocks away.'"

The following account describes a staff member who began to shift away from reacting to the annoying feature of the child's behavior to the positive reinforcement of productive conduct.

> Dorothy was causing some disturbance recently by throwing blocks around somewhat wildly. Miss S brought a large plastic container, set it next to Dorothy, and advised her that she could throw blocks into the container. She put the container right under Dorothy's hand while Dorothy had a plastic block in it and tapped the back of her hand to get it to drop into the box. After an approving verbal comment, she followed Dorothy further until Dorothy had dropped all of the blocks into the box and put them away.

The student-therapist were frequently aware that their ability to control the child and his environment were related to their basic observational skills.

The use of materials and arrangement of the physical environment. The following observation is an example of the increase in the therapist's ability to provide an environment more reactive to the child's repertoire and accommodating a wide range of behaviors.

"One of the major changes in one trainee's pattern of working in the children's room was setting out or making available more materials in the classroom such as an easel painting or a simple block structure which she arranges before the children arrive. She had also increased the number of group experiences, and she experimented with situations involving two or more children. For these kinds of experiences she had used musical instruments, ball-rolling activities, or some that she seemed to have designed such as dropping clothes pins in a container. Children are not coerced to join these activities in any way, but she initiates participation by having the materials available." (C.F.)

Increased study behavior. Paced with the changes which we were able to observe in the student's therapy activities were an increased frequency of reading related textual materials.

Miss S had noticed a reference to the Ferster and DeMyer article on "The Development of Performances on Autistic Children in an Automatically Controlled Environment" and asked if it might be possible to get this. I had since given her a copy and had also mentioned that a new book had been placed in the library by Rimland, Infantile Autism. She had checked out the book by Rimland, began reading it and said she found it most valuable. She stated that it was the first time she had read very much about the kind of children she was working with. Such activities were to be expected from academically-oriented and relatively advanced staff members, but was a new development for those staff members with little formal education.

The design of therapy programs. One of the effects of the training program was an increasingly active role for the students in the design of self conscious therapeutic programs for specific children. The following notes describe how one staff member's observations of a child prompted a shift in the therapeutic strategy.

> Following Miss S's interview she commented that Mr. K had offered a suggestion in regard to Dorothy's eating behavior. In brief, Dorothy's eating behavior problem involves her highly repetitive requests for any kind of food constantly during the meal time. The goal is to reduce the number of times Dorothy makes requests for food. Jeanne Simons and Miss S have been attempting to ignore all of Dorothy's behavior and give her food only when she is quiet. This, however, has not been very successful. With this as a comment on Dorothy's eating behavior, Mr. K suggested that they might try to immediately give her what she wants with no contingencies attached and that perhaps having experienced complete possession she will no longer demand. Later during the morning, Mr. K in passing commented that he had an experiment in mind in terms of Dorothy's behavior and

> that who knows he might even be able to get it published. At this point the validity and importance of what his suggestion was seems not as important as the fact that Mr. K was quite excited by and generated some kind of experimental project.

Self observations. One of the products of the increased observational skills of the therapist was increased sensitivity to their own conduct. Most of the staff members began to edit their own speech very consistently as they talked about the children. This indicated a self critical attitude toward the practices which allowed them to both their observations and the kind of activities they carried out.

IMPEDIMENTS TO THE TRAINING PROGRAM

The creation of a training program by approximations, fitting into the existing Linwood setting, resulted in many adjustments. The descriptions of materials showed some of the ways the content and procedures of the training program were adapted to the setting and repertoires of trainees. It is perhaps a mute point whether these should be termed adjustments or impediments. In any event these factors influenced the effectiveness of the training program and their recognitition is important for the development of future programs.

One problem came from the lag between the introduction of new content and behaviors by staff experienced in operant reinforcement and the subsequent support by the clinical environment. Staff trainees felt a lack of continuity in the use of information from the principles of operant reinforcement and the opportunity to use these in their work with the children. This is, perhaps, inevitable in a situation where the training program is not a complete integral part of the treatment center. It may be that the training program needs to be extended over a longer period of time to accommodate this lag. It is possible that the lag came partly from the necessity of training the key Linwood staff at the same time that they were under pressure of clinical responsibilities of the center and the training responsibilities for students.

Finding the time for the training program was constantly difficult. Unpredictable interruptions from the therapy requirements of the treatment center disrupted some of the programming. In many cases, the training program required the students to spend time during the day when they otherwise would be responsible for the children. The pressure of the hour-to-hour care of the children often made it difficult for staff members to do both. As a result these supplementary experiences sometimes became a burden, and instead of offering a chance to enlarge the understanding of reinforcement therapy they became aversive.

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At times the students' experience in the academic training program stimulated so many suggestions for training experiences that the activities they prompted interfered with the completion of the remaining part of the course. Each use of the morning study hour for demonstrations or group discussions further slowed down the rate at which the students completed the basic training in reinforcement principles. A balance between these two competing activities was not always easy to achieve.

Staff turnover reduced the rate of development of materials and the progress of the training program. By the end of the project, none of the original trainees remained at Linwood. Although subsequently many staff have remained for substantial periods of time. It is possible, for example, that the training program involves such severe changes in the kind of involvement the staff member has with the treatment center that some kind of people may not be able to adapt.

The location of the library for general staff use was somewhat a handicap. The supplementary readings were located on the third floor of the Center in the Director's office. The distance as well as the concern about interruptions probably decreased the use of the texts. It would also be an advantage to have the library located in an area that would permit browsing and a closed area for study.

Recommendations for Future Training Programs

The implementation of a training program for incorporating reinforcement principles with clinical methods required considerable trial and error and adjustment as the preceding discussion has shown. The following are the recommendations arising from our experience at Linwood for future training programs of similar scope and intent.

(1) The nucleus of the staff of the Center, and especially the major therapist, should be trained in behavior principles before the larger staff begins training. This would reduce the lag discussed previously between the staff training and subsequent support by the clinical environment.

(2) An orientation program, including discussion of the value of observation skills and a technical vocabulary should preceed the introduction of the course of instruction.

(3) Techniques for identifying and documenting increments in the behavior of trainees are important. Graphs should be used to record the rate of progress. Quantitative methods, such as these devised by Bijou and Lindsley should be used to document staff effectiveness with children.

(4) Interviews in the educational program need to be recorded periodically and evaluated to avoid shifts in the degree of precision. This is particularly important if there were no "expert" in reinforce-

ment principles as part of the training staff. Particular attention needs to be given to scheduling of interviews and the supplementary experienced. Both time intervals and the ratio of performances need to vary to accommodate the range in individual repertoires.

(5) The use of written questions and frequent opportunities for applications of content to the clinical setting need to be included frequently. Applications of the content of the training program should occur frequently enough to reinforce study behavior in the course.

(6) Staff persons responsible for the interviewing procedures need clear guides to: 1. consistently review the texts and recheck the precise use of the technical language; 2. be aware of and ignore irrelevant behavior; 3. check comprehension through the application to therapeutic situations rather than just talking about them; 4. observe individual differences and vary the study units accordingly.

(7) There need to be frequent opportunities for staff to model skilled staff members. Casual conversations, group discussions, and chances to listen to the use of precise technical language need to be encouraged in many ways.

(8) Staff visits should be scheduled to various typed of centers concerned with children, exceptional and normal. Therapists consistently exposed to bizarre and deviant behavior particularly need to maintain perspective of the normal pattern of growth and development.

(9) A structured study center would lend considerable support to patterns of study and improvisation of new techniques. Such a center would provide areas for study and interviewing, resource materials, a library and an experimental space all near each other.

CHAPTER 7

CLASSIFICATION AND DESCRIPTION OF THE AUTISTIC CHILD'S BEHAVIOR

In this chapter the concern will be the classification and description of the autistic child's repertoire. Some description and classification of the autistic child's repertoire behaviorally and clinically has already been carried out in Chapter 1. We will be concerned here with some of the issues involved in the classification of pathology in general. Chapter 8 will be an application of a functional analysis of behavior to describe a simple child observed in detail over a period of almost three years. The description will proceed from a direct observation of the child's conduct to a general process both with clinical concepts and with reinforcement principles. The results will be clinical and experimental languages, side by side referring to direct descriptions of the child's conduct. Before proceeding with a classification of the child's behavior it will first be necessary to know the general behavioral processes which provide the categories for the classification. After a detailed functional analysis of behavior has been made it will be profitable to discuss the distinctions that have been made between infantile autism and childhood schizophrenia.

A Functional Analysis of Behavior

When we talk about a behavioral description we obviously do not mean simply a description of a performance without its relation to the environment which generated it. When performances are described in relation to the environment, then descriptions is referred to as a functional analysis of behavior.

To classify behavior, we take into account both static and dynamic factors or, in other terms, we describe it topographically or make a functional analysis. A static or topographic analysis essentially describes what occurred, as in a movie or speech record. Such a record may be as objective and as reproducable as any other datum in biology. It lacks, however, the functional or dynamic relation of the behavior to the controlling environment. The simple identification of the performance, as it may be recorded, without references to its antecedent conditions or current relations to the environment, omits much important information. Many objections of clinicians to behavioral descriptions come from the assumption that behavior is described without referring to the environment. The distinction between "just behavior" and behavior described with its functional relation to the environment is illustrated by the description of a depressed man walking. Whether a slowly moving man is "depressed" or merely moving slowly is not easily or reliably determined by observing his behavior alone. The relation of his behavior to events in the past or present environment is a critical element in the description. Very strong behavior can be emitted at a low rate if its successful outcome depends on such a low rate and weak behavior can occur at a high rate. Performances about to cease may occur at a high rate just before they stop. A complete moving picture record of "a man running down a corridor" does not provide enough data to classify the behavior. The man could be running because someone is chasing him. The man could be running because the train will leave in ten minutes from a distant station. The man could be running because he has just won a sweepstake prize. All of these behaviors are closely similar to each other topographically, yet they are related to the man's environment in very different ways: In the first case, running escapes an aversive outcome. In the second case, the departure of the train on schedule is a limited-hold schedule of reinforcement which increases the rate of running, and there is an emotional state in the third case. A child's crying is also a topographic pattern which can be the result of very different kinds of behavioral control. It could occur as a reflex elicited by a loud noise, or it could come from a parent who increases the frequency of the crying by reacting to it. The relation of the child's crying to the environment is very different in the two cases. If the crying is reflex, say caused by a low temperature or food deprivation, its frequency may be decreased by dressing or feeding the child. If the crying occurs because of the parents' reaction, then its frequency and form will depend on how the parent reacts. When crying is an operant performance the schedules of reinforcement by the parent, the stimuli present whenever the child and parent interact, and the kind of parent reaction will all influence the frequency, magnitude, and form of the child's crying.

We ordinarily describe performances by noting their form. We say that the child raised its arm, or the rat pressed a bar. Yet, the description of performances even as simple as these requires an account of how these performances change the environment. In the typical lever-pressing experiment, in which a rat receives a pellet of food by pressing a lever, we do not reinforce an exact form of bar-pressing. Rather, we arrange an electro-mechanical environment which responds to any performance which moves the lever enough to activate the switch. The lever and its switch may be profitably thought of as an environment which generates a class of performances having the common property of activating the food-dispensing mechanism. It is not necessary to teach the rat step-by-step, to raise the forefeet to 2 cm.'s over the bar, lower the feet while contact is made with the bar, grasp the bar, and then press with a force of 15 grams. All of the essential properties of the behavior are already determined by the electro-mechanical properties of the system. The essential form of this argument was made by Skinner (1937) in his discussion of "the generic nature of the stimulus and response" in the Behavior of the Organisms. The form of the child's crying will depend upon the reactivity of the parent, just as the form of the rat's bar-pressing response was determined by the switch behind the lever. The form of each child's crying is likely to be maximally aversive to the parent, because the parent is more likely to take an action (such as feeding the child) to stop the crying when the child is very annoying than when it is less annoying. The change in the environment that increases the frequency of a performance will describe the performance,perhaps more accurately than the topography. Bar-pressing could therefore be referred to as switch-closing and crying as parent-annoying behaviors. The topography is useful when we need to refer to the different ways that a rat may close the switch and the different ways a child may make a demand on a parent.

In both colloquial and clinical language a simple term usually describes both the performances and its reinforcer. Thus when one child throws a ball at another child we say that he is "angry." The description of throwing a ball as "anger" comes from the presumption that the performance is reinforced by the damage it inflicts on the other child. The extra force that the ball is thrown with is taken as collateral evidence that the performance occurs because of the damage it inflicts. Another instance in which a ball is thrown to another child "playfully" implies that the reinforcer for the performance is the action of the other child when he catches and throws back the ball. The careful aim, the well-modulated speed of the ball, and the wait until the child is watching is taken as collateral evidence that the ball was thrown playfully. The functional analysis has the advantage that it describes the episode by relating directly and objectively observable terms to each other. The clinical description has the advantage that it is a brief summary that conveys much prior experience.

THE ENVIRONMENT

When we speak of an individual's environment there is the possibility of ambiguity because of the many connotations that are possible. At the one extreme there is the physical description of a person's surroundings which does not have great significance in a psychological account. At the other extreme are those aspects of the world, both people and things, that are functionally related to a person's conduct. Thus, in the more limited sense a person's environment may consist of elements which bear little relation to his life. Conversely, those elements of the environment that are the main influence on the individaul's life are but a small part of his physical surroundings. The environment consists partly of people, as physical objects and partly as people whose behavior is a reactive element. Thus, an individual's environment also consists of the speech that various people engage in independently and reactively. An individual's own behavior must also be thought of as part of the environment, because it changes the world about him.

Defining an individual's functional environment becomes troublesome when we try to take into account the reactivity in it that might potentially reinforce an individual's behavior. The potential reactivity of the environment is the aspect of the individual's surroundings that will change if the required performance is emitted. An example of a potential reactivity (reinforcer) in the environment is a listener who may reply if spoken to. Yet, unless the speaker has a way of speaking that will be an effectige stimulus for the listener the reply will not be forthcoming. For the speaker who cannot emit a performance which will instigate behavior in a listener the listener is not potential reactive environment but merely a part of his physical surroundings. To phrase the problem more generally, some reactive features of an individual's surroundings are so far from his current repertoire that they cannot be considered as part of his functional environment even though they are physically present and potentially reactive to a particular kind of conduct were it to occur.

The analysis becomes even more difficult when we consider successive approximation of the individual's current repertoire to produce new modes of conduct which could influence the environment. Theoretically, it would seem, no feature of the environment is so far removed from an individual's repertoire that successive approximations could not produce an effective form. Consider, for example, the relation between the University environment in the broadest sense of all the forms of human conduct it can react to and the repertoire of an illiterate man. In the simplest sense of an environment as an individual's physical surroundings, many features of the campus are available simply by walking to the various places. Nor is the campus environment unavailable to the illiterate man as a student, at least potentially and theoretically. He could learn to read, enroll in elementary and high school and then apply for admission to the college. Potentially every reactivity of which the college environment is capable can be tapped by an illiterate man, if he develops the required modes of conduct in successive approximations to the required complex form. The college is not part of the illiterate man's functional environment because there are no parts of his current repertoire which are maintained by reinforcers which bear any relation to the kind of environment found in the University.

The Milieu as the Reinforcers Which Generate the Performances of the Individuals in It

A person's conduct may operate on the physical and social environment in many ways, but only certain kinds of changes will successfully maintain the frequency of critical kinds of behavior. Just like the switch behind the lever and its connection to the food dispenser are responsible for the rat's bar-pressing performance, the human environment may be thought of as potentially reactive to many kinds of conduct.

One way to describe behavioral pathology is to note the potential reactivity of the individual's environment and the performances which could produce consequences, relevant to the person's life which are not in his repertoire or occurring at a low frequency. Potentially reinforcers exist for every individual if he emits the proper performance on the proper occasion. One has only to paint the picture, work effectively, build a piece of furniture, tell a funny story, give affection and reactivities exist in the normal milieu to respond with money, love, affection, social response and prestige. Conversely once a repertoire taps the environment in a way relevant to the individual, the natural reactivity to the environment will continue to sustain the performance. Therapy is required when there is a lack of contact between the individual's current repertoire and the reactivity of the environment he is in contact with. Many different situations may be responsible for a mis-match between a person's current behavior and a reactive environment to support it. The way these mis-matches can arise in a child's development, the etiology of autism and childhood schizophrenia, will be discussed in Chapter 10. The purposes of this chapter will be to describe the relation between the individual's performance and his current environment so the reasons for the discrepancy can by analyzed. When we can describe the individual's current repertoire and the reinforcers maintaining it, it should be possible to devise a set of approximations by which the reactivity of the current environment can be adjusted in slow stages, paced with the individual's development, to bring him into contact with more subtle and demanding aspects than he was in contact with before. Examples have already been presented in Chapter 3 of children's environments which were progressively adjusted to bridge the child from the current ways he could influence the treatment center environment to performances which could make contact with the complex structured aspects of the natural environment. The extra privileges of schoolroom children over less-advanced children is one example of the potential reactivity of even the therapeutic environment, which the child can tap if his performance can be shifted in successive approximations each sustained by a part of the existing environment. The requirement that a child be continent before he can ride in a car to the drug store for an ice cream is another.

All of the components of an individual's environment may be profitably studied by the way they react to the particular kinds of conduct. Skinner has already presented the outlines of such an analysis of "Culture" in Science and Human Behavior (1953) for the behavioral practices involved in religion, government, law, economics, and psychotherapy, and for verbal behavior in general, in Verbal Behavior (1957). The customary behaviors of an individual occur because of consistent reinforcement and non-reinforcement by the community. For example, some of the reasons for the custom of wearing shoes or a tie may be found when we examine what happens when we don't wear them. Wearing a tie and coat is so stringly established that we do not ordinarily consider what might happen if a stockbroker, for example, went to his office without them. The English language is similarly a set of customs maintained by explicit contingencies applied by a community of individuals, all of whom will react only to particular stimuli. Verbal behavior, mores and morals, laws and customs are best considered as a set of contingencies applied by the various members of the community to the relevant performances of the individual. Conversely, the performances of the individual are caused by the way they change the environment--the contingencies of reinforcement applied by the culture actually determine the practices of the individuals.

The Reinforcing Practices of the Milieu is Standard of Reference for Classifying the Behavior of the Individual.

Just as the potential reactivity of the lever and the parent defined the kind of behavior that might be generated in the rat and the child in the previous examples, the milieu specifies the behaviors potentially available to an individual on contact with it. An individual's environment might be thought of as an infinite variety of switches, all of which are set to produce a reinforcer or avoid an aversive stimulus if only the individual's repertoire contains the required behavioral items. To compare different individuals, therefore, it is necessary to refer their repertoires to the environment which generated it. We enumerate these performances in the individual's repertoire which alter the environment and compare them with the repertoire that can be potentially supported by the environment. The description of the repertoires that an environment supports is the same as an anthropological description of a culture.

The use of the milieu as a standard of reference provides a classificiation system which may be applied across cultures because it does not refer to specific items of behavior or a specific environmental practice. Two entirely different repertoires from two entirely different cultures might have in common that all of the performances in the repertoire are maintained by positive reinforcement, and that the individual repertoires are the maximum that could be maintained by such an environment. Or, a reinforcement schedule that required too many performances to achieve the critical effect on the environment might cause a college professor to stop reading and a salesman to stop telling funny stories. Even though the performances are different the reduced frequency comes from the same relationship to the environment--the schedule of reinforcement.

Conversely, two apparently similar repertoires may be functionally very different when they are compared to the total milieu in which the individual is in contact. For example, the role of reading in the total environment of a college teacher and a salesman is very different so that a reduced frequency might be pathological in the case of the professor but not for the salesman.

A discrepancy between an individual's actual conduct and the repertoire that his current milieux suggests he might have cannot be evaluated simply by noting the actual performances that are missing. Two very different performances might be missing from a repertoire for a common reason, as in the professor's reading and the salesman's funnu stories in the example above. Or, a performance might be missing from the repertoire of two individuals for very different reasons. A low frequency of reading in the case of a professor may be symptomatic of severe depression while the salesman's repertoire is a reflection of an environment that is not very reactive to reading.

CLASSIFYING BEHAVIOR BY PRINCIPLES OF REINFORCEMENT

Because the exact relationship between a performance and the particular reactivity in the milieux that generated it is so critical for classifying the presence or absence of the performance, it will be necessary next to enumerate the basic processes which determine an individual's performance. The basic processes by which a performance is generated, strengthened, weakened, maintained, suppressed, distorted, or cued provides the framework for specifying the relation between the individual's existing repertoire and the milieu potentially available to him. The major categories for such a description follow below.

Positive Reinforcement

Reinforcement is, in most general terms, the major cause of behavior and the key concept (Skinner, 1953) in describing how new behavior is developed and how it is maintained by the environment. By reinforcement is meant, first of all, the immediate consequences of the performance. The behavior of the child in reaching for a block is reinforced by the tactile contact of the block in the child's hand. The stimulus, "block in the child's hand," however, may in turn be reinforcing because of further relationships to the child's repertoire. The essential point is that the reinforcement of a performance is specific, immediate, and an identifiable consequence, no matter how complex the prior events which contributed. To find the cause of behavior, we analyze the effect of that behavior on the environment. Conversely, to determine which events are reinforcing, we examine those environmental consequences which maintain the child's behavior. Although reinforcement is relevant to almost every behavioral process, it is especially concerned with a question of "Where does the rapidly developing complex repertoire come from?" Many stimuli reinforce behavior without any explicit behavioral history, as for example, many of the events which maintain the behaviors of the infant. Many visual changes are potential reinforcers for the young infant as, for example, the movements of the hands and fingers in the field of vision.

Shaping New Forms of Conduct

Once we have identified an effective reinforcer or when a new reinforcer is developed by the processes described below, it may be used by the process of differential reinforcement to successively approximate new forms of behavior never before occurring in the organism's repertoire. Shaping new forms of behavior from old ones is a corollary of positive reinforcement. The process is most relevant to the growth and development of the infant. It is here also, that the basic process is most easily seen in relation to the principle of positive reinforcement.

Weaning as an Example of Successive Approximations of New Forms of Behavior.

The shaping of behavior by differential positive reinforcement occurs continuously in almost every stage in the development of the infant. Consider, for example, weaning the infant to a cup. Here, a new set of performances reinforced by the ingestion of milk is to be developed. At first, the repertoire which the child brings to bear upon the drinking out of the cup is almost entirely appropriate to the behavior developed previously when it sucked its milk or put other objects in its mouth. If this performance is at all successful in producing some milk in the mouth the behavior will be sustained, and conditions will be present for the differential reinforcement and shaping of the behavior in the direction of the complex performance eventually required in drinking. Any variation in the infant's behavior which will produce more milk in the mouth will increase in frequency, and those activities which have no effect will gradually decrease. The likelihood of developing the new performance depends upon (1) the physiological development of the organism, so that it is ultimately capable of the behavior; (2) a current repertoire which contains at least the minimal elements to produce at least some food in the mouth and, hence, maintain the behavior necessary for the further shaping of the final drinking performance, and (3) a sufficient level of food deprivation, so that the appearance of given quantities of milk in the mouth from the cup will be sufficiently reinforcing to continue to maintain the performance. Just after having completed a meal, for example, the likelihood is smaller that a child will learn to drink from a cup.

Other Examples of Successive Approximation of New Forms of Behavior.

By similar applications of the differentially reinforcing effects of the child's physical environment, there is a continuous shaping of many kinds of behavior, such as picking up objects, eating from a spoon, crawling, walking, sitting erect, focusing the eyes, and manipulating objects with the hand. The young infant acquires control over its limbs as the various movements are differentially reinforced when the child's hand passes through its field of vision or results in the tactual contact with a part of the crib. The final repertoire of playing with its hands in front of its eyes is approximated by the diffuse arm movements occasionally passing the field of vision. The first change in performance becomes differentiated progressively as closer approximations to the maximally effective performance have more direct effects in the visual field. All of these are performances which initially have only limited effects upon the environment, and later develop progressively as successive approximations to more effective forms which have more direct reinforcing effects in shaping up the movements of the sensitive parts of the fingers.

Naturally, these processes operate in the context of a physiological maturing organism. The effect of the differential contingencies of reinforcement in developing the increasingly complex repertoire of the growing child is paced by the state of muscular, neurological, and biochemical maturation. Operant reinforcement in the newborn infant often acts in the context of reinforcing behaviors which are originally reflex, for example, crying and eating. Originally, the infant's sucking is elicited, as in a reflex. After experience, however, the operant control resulting from the differential effects of different degrees of sucking "shapes" the behavior. Originally, the infant's cry is an unconditioned effect of food deprivation, gastric distress, etc. Later, however, crying comes under the control of operant, as well as respondent reinforcement because it is a response of striated muscle and amenable to control by its consequences.

INTERMITTENT REINFORCEMENT

Because reinforcement is likely to become intermittent under many conditions important changes in a performance even after it has appeared in the repertoire. Many schedules of intermittent reinforcement are possible, which profoundly influence how frequently a performance may be emitted. The social nature of much of human behavior is an important source of intermittency of reinforcement.

How Intermittent Reinforcement Arises

Whenever reinforcement depends on the behavior of another individual there is a likelihood that it will be intermittent because another person's conduct is influenced by so many conditions. Asking a question, for example, leads to a reply only if the person is listening. The physical environment also frequently reacts intermittently. The child digging a hole in the earth must operate with its shovel the required number of times before the hole appears in the required depth; or he must reach for a certain number of blocks before the structure he is erecting can be completed. Many social behaviors, such as persuasion, selling, or simply telling a story require a certain amount of behavior before they can influence the listener. Almost all educational and verbal activities are intermittently reinforced. Writing a letter requires a series of performances, doing long division consists of a series of component activities or reading an instruction. In fact, there are only few performances, those acting on the physical environment which are not intermittently reinforced. Even in the physical environment intermittent reinforcement is the rule rather than the exception as, for example, the component behaviors needed to dig a hole or climb to the top of a stairway.

Chapter 7

Intermittent Reinforcement may Strengthen or Weaken a Performance

Intermittent reinforcement mainly influences the frequency of a performance. Paradoxically it may at the same time weaken or strengthen behavior depending on the aspect of the repertoire we pay attention to. How long and how persistently a performance occurs when it is no longer reinforced, depends on the prior schedule of reinforcement. A performance which has been consistently reinforced will disappear from a repertoire much quicker than one that has been intermittently reinforced. Within limits, the greater the intermittency the greater the persistence. As an example of this aspect of intermittent consider the persistence with which a child will cry for its parent. A child will cry much longer, if there have been occasions in the past when the parent came only after the child cried for enough times to discomfort the parent than if the parent came promptly each time. Once such a pattern of crying is established it can be changed only with great difficulty because the performance becomes so persistent that the parent cannot withstand its unpleasantness.

Nagging and teasing are another phenomenon in which the persistence of a performance after it is no longer reinforced makes it difficult to alter the behavior. When a child whines, annoys, or otherwise aversively stimulates the parent, the aversive control of the parent by the child represents an intermittent reinforcement of the teasing behavior. The child's repeated requests for a cooky are an aversive stimulus which the parent terminates by giving the child a cooky. The aversiveness to the parent of the child's nagging depends on how many times and for how long the child nags. The parent will reinforce the whining behavior by giving a cooky whenever the nagging is continued sufficiently long to be an aversive stimulus intense enough to reinforce escape. The extent of aversive stimulation necessary to reach the parent's "threshold" will vary from time to time, however, depending upon the parent's mood, the number of other sources of aversive stimulation, or other current activities which might be prepotent over the control exerted by the child. The variability in the reactivity of the parent results in considerable variation in the amount of teasing and nagging which is needed to produce the required effect upon the parent. This schedule of reinforcement (variable ratio--similar to that generated by a slot machine) is one which generates a high and sustained rate of behavior for a long period after reinforcement is discontinued. When the reinforcement of the nagging and teasing becomes sufficiently intermittent, the child's persistence may become so extreme that the parent cannot withhold the cooky, and the child's control becomes prepotent over any activity the parent might engage in.

The frequency of a performance falls as the schedule of reinforcement becomes more intermittent despite its greater persistence after the discontinuation of reinforcement. Thus intermittent reinforcement is one of the major ways in which beahvior is weakened. The weakening of performance because of the intermittency of its reinforcement is particularly pronounced when reinforcement depends on large relatively fixed amounts of behavior. Such is the case with the novelist who has to emit a large amount of behavior to complete the book or the student studying for an exam or writing a term paper, or a long walk. The inability to begin a new novel or study at the start of the new semester represents the reduced frequency of the performance as a result of the large amount of behavior required in the past. The student's inclination to begin a task is in general proportional to how much behavior is needed to finish it. A performance is reinforced consistently when its form is appropriate to the effect on the environment that maintains it and when it is emitted on an occasion when it can be reinforced.

The ability to sustain the large amounts of behavior that are required for the critical change in the environment requires a history of experience in which smaller amounts of behavior have been successfully sustained. If the amount of required behavior for reinforcement is increased too rapidly the performance may disappear from the repertoire despite the fact that the performance could be sustained under other conditions.

The usual social environment introduces intermittency to its children very gradually. Most parents reinforce much of the behavior of the infant almost continuously at first. Almost any vocal performance a young child makes leads to a reply. Indications of distress are attended to immediately and even moment-to-moment activities lead to a parental comment or reaction. As the child matures, more and more intermittency occurs, however. Part of the reason for the increased intermittency of reinforcement comes from more stringent requirements which are placed on the child as it matures and enlarges its repertoire. The child who has merely to gesture for food or a desired object now has to "say something," perhaps a whole sentence, perhaps even supporting reasons for the request. The amount of behavior in the child's chores increase as he grows older. The very young child may just have to draw the cover over his bed. Later he will be required to adjust it properly and smooth out the wrinkles. The five-year-old may have the task of emptying a wastebasket while the nine-year-old will set the table. The youngsters area of locomotion is limited to distances accomplished by a few steps while the older child goes on errands and excursions requiring distances as long as a quarter or half a mile. In all these instances the amount of behavior that the child needs to emit for a unit of effect on the environment is gradually increased. Similarly in school. The first grader's worksheet contains perhaps 6 or 8 two-number addition problems. Later the problems will be with two-digit numbers and in the upper elementary grades he will be required to do a series of long division problems each consisting of many addition and multiplication operations any one of which would have taxed his ability to persist in an earlier grade.

The occasion on which a child acts will influence its successful reinforcement as much as the form of the behavior. We frequently pay attention to the very young child, whether or not the child's behavior is intrinsically interesting to us. As the child grows older, however, its verbal performance needs to be relevant to the repertoire of the listener, or they go unreinforced. Attempts to gain the listener's attention are successful less frequently as the child grows older.

The Necessity of a Gradual Adjustment in the Amount of Behavior Required for Reinforcement.

The specific history by which the child is introduced to intermittent reinforcement determines whether or not the child can sustain the large amounts of behavior that are needed for reinforcement of the mature repertoire. The child can acquire sustained and persistent behavior only if the increase in the amount of behavior needed for reinforcement is paced carefully to the child's current ability. Some of the ways that persistence and sustained conduct are slowly developed in normal growth and development have just been described. Too sudden a change in the amount of behavior required of a child for reinforcement may result in a loss of the behavior, however. Such accidents of development account for many of the differences between children in the development of athletic skills. The performances needed to learn a sport, say baseball, are reinforced on a schedule in which progress in the skill comes with an amount of practice (technically, a fixed-ratio schedule). The difference between the person who is enthusiastic about fishing and the one who is not may be the schedule of reinforcement during the first experiences (assuming catching a fish is the reinforcer and sustains the fishing performance). Students in mathematics classes frequently suffer a lack of transitional schedules from rote procedures where they succeed continuously to more difficult areas where sustained attempts, some unsuccessful, are required to achieve mastery. In general, the amount of behavior required of a student to produce a result increases continuously from elementary to graduate school. Adolescence is a time when the community increases the amount of behavior required of the child and there is the danger that too sudden an increase in the amount required will accidentally weaken the repertoire. Instead of the simple, direct reinforcement of the child's social behavior, the adolescent needs money, careful dress, advance planning of social contacts and the complex behaviors of dealing with the opposite sex.

In general, the effects of intermittent reinforcement constitute one of the major factors in determining the later disposition to action. The stubborn child, the industrious child, or the child who discourages easily are individuals who reflect, to a large extent, optimal or unoptimal schedules of reinforcement, or histories of reinforcement which establish performances under strong control of the schedules.

Some of the discrepancies between an individual's repertoire and the reinforcers potentially available in his environment may be simply due to an inability to sustain enough behavior. Slack (1960), for example, has observed adolescent delinquents who stole goods in a department store even though they had money because they could not sustain the series of activities needed to pay for the goods. Simply taking what they wanted required less behavior. Educational systems frequently adjust the schedule of reinforcement explicitly, depending upon the extent to which the educational reinforcements are maintaining the child's behavior. When the child is "doing very well," we generally withhold reinforcement. When it becomes discouraged (disinclined to study), we reinforce more frequently, until the disposition to study increases.

Stimulus Control of Behavior

The occasion on which a performance may be reinforced may have a large influence on the frequency of a performance. Therefore, it is one of the general behavioral processes which may contribute to or weaken parts of the individual's total repertoire. The general processes have been referred to in Chapter 1 in the discussion of the autistic child's perceptual repertoire and in Chapter 3 where the bird over-turning pebbles came under the control of their distinctive feature of those pebbles under which there were insects. The process is seen in a simple form in the example of the child reaching for the key to the cupboard in which there are cookies. Standing on the floor, the performance falls short of reaching for the key, while standing on the chair the movement of the child's arm brings the fingers into contact with the key. The basic process that occurs is decreasing the frequency of reaching on all occasions except the proper distance from the key. Reaching for the key is reinforced on the one occasion and its frequency maintained; and not reinforced on another occasion and its frequency reduced. Some performances are under the control of circumstances that are frequently present, others are reinforced on very special circumstances.

Child-rearing practices are frequently a balance between the necessity of restricting the child's behavior by permitting behavior only on certain occasions, and the overall effect of weakening the child's behavior when a restriction results in some behavior going unreinforced. The child who runs and jumps outside rather than in the house is emitting performances under the control of a particular occasion. Parental attention is procedurally a way of reducing the frequency of speaking except when the parent is attentive. As the child matures however, the occasions on which the adult will reply are likely to be restricted considerably. The narrowing of the control over the child's performance are usually paced with the overall development of the repertoire. A newly emerging repertoire, with little history of intermittent reinforcement is likely to be reinforced almost indiscriminately in most homes. As the performance becomes more stable and persistent the child is required to make more distinctions. The control of a performance by the occasion on which it may be successful is at once a way of strengthening the child's repertoire and potential dnager which could weaken it. The control of the child's behavior by the appropriate occasion guarantees that the performance will not be emitted when it cannot be reinforced. Hence, intermittent reinforcement is avoided. On the other hand, many different performances are reinforced only on very narrowly defined circumstances, it is likely that much unsuccessful behavior will be emitted. In the extreme case, a narrowly controlled repertoire may be very fragile because it can be so easily disrupted by sudden changes in the environment. The situation is illustrated by the classical description of the psychotic depression that results from the death of one of two spinster sisters who had lived together in complete seclusion. The death of the sister is functionally analogous to a sudden removal of stimuli which supported almost all of sister's conduct. The depression in this case comes about because the performances are so narrowly under the control of the sister, that her absence literally leaves the remaining sister without a repertoire. A similar incident probably responsible for the development of an autistic child will be described in Chapter 8.

Example of Different Degrees of Narrowness of Stimulus Control

It is paradoxical that the parent who is most attentive to the child and deals with it constantly may be the one who most seriously weakens its behavior. It is quite possible that some cases of childhood schizophrenia stem from parental practices which specify so carefully the conditions under which the child may behave that so large an amount of behavior goes unreinforced that the overall ability of the child to deal with environments other than the specific parental one is seriously impaired. This hypothesis will be discussed in the chapter on etiology (Chapter 10).

The narrowing of stimulus control is illustrated by the progressive role the parent plays for the child as a listener. At first the child speaks whether or not there is a listener even though the original reinforcement for the behavior came from its effect on a listener. Later he speaks in the presence of a listener but may persist even when the listener is inattentive. Still later, the focus of the listener's eyes and his facial posture will control his speech and still later particular thematic content will be reserved for different listeners.

Each of these stages, in which the speaker's performance is controlled by a more narrow range of stimuli, comes about from non-reinforcement of the speaker's behavior on inappropriate occasions. The result may be either a very durable repertoire because it is now emitted under the exact circumstances where it can be reinforced, or a potentially weak repertoire because it can be disrupted by a slight change in circumstances from the small range of stimuli where the behavior is appropriate. A second, though related source of weakness for narrowly controlled performances comes from the large amount of non-reinforcement that goes into conforming the behavior so narrowly to the environment. The discussion of the etiology of autism in Chapter 10 will describe some of the specific kinds of circumstances that might lead to weak behavior as a result of close control by the environment.

Conditioned Reinforcement

While it is often convenient to speak of food as the reinforcement for a pigeon pecking at a key or for the child opening a door leading to a dining room, a more detailed analysis of these behaviors shows that we are dealing in these cases with long chains of performances maintained by conditioned reinforcers which support the intermediate performances leading ultimately to the final consequence maintaining the total behavioral episode. The essential nature of the process is most simply explained with the behavior of the pigeon pecking at a disc which is understood best by reviewing the conditions under which the performance is originally established. The first stage in the training procedure is simply to open the food dispenser and allow the bird to eat. The behavior of pecking at the grain and swallowing it is already in the bird's repertoire, so that all that needs to be reinforced (by the sight of food in a position where pecking at it will result in food in the mouth) is walking toward the food dispender. After the bird eats readily from the food magazine, the bird's behavior is brought under the control of a special stimulus, a light which comes on only when the food dispenser is available. Approaching the closed dispenser in the absence of the light weakens that behavior, and approaching the food dispenser in the presence of the light results in the sight of the grain in the open magazine, and the bird eats. After a small amount of exposure to these procedures, the bird stops approaching the magazine in the absence of the light (extinction), and rapidly approaches the food dispenser whenever the light is on. This behavior is maintained by the sight of food and, in turn, by food in the mouth, etc., leading ultimately to the digestion of the food following the chain of gastrointestinal reflexes. The light accompanying the open food dispenser can now be used as a reinforcer for producing new responses not yet in the pigeon's repertoire. The bird occasionally faces the key at which he is to peck as he moves about the cage. At this instant, the light over the feeder is turned on, and the already-established chain of responses occurs. As a result of one or two reinforcements of this kind, the frequency with which the bird repeats the performance of holding the head in the direction of the key increases, and the chain of responses has become one response longer. Turning toward the key is followed by the magazine light which is in turn the occasion upon which the remainder of the chain may be emitted and reinforced. The magazine light may then be used to approximate the pecking behavior by differential reinforcement.

When the bird faces the key, his head nods slightly in the direction of the key, and the appearance of the light now occurs only on the occasion of a nod. The result of this change in contingency is an increased frequency of nodding and the chain of response now consists of a nod in the direction of the key, followed by the magazine light, etc.

The occurrence of the magazine light is then progressively made contingent upon larger displacements of the head until, finally, the bird is striking the key. The chain, or sequence of responses may be extended again in an identical manner by now reinforcing pecking at the key only when the light behind the key is green, and allowing pecks at the key to go unreinforced when the light behind the key is red. As with approaching the food magazine, the frequency of pecking at the red key soon declines to near zero (extinction), while the bird continues to peck at the green key. As with the magazine light, we can now reinforce a new response by turning the color of the key to green contingent upon something else which the bird does. For example, every time the bird steps on the treadle on the floor of the cage, the color of the key changes from red to green. In the presence of the green color, the bird pecks at the key producing the magazine light, which is the occasion upon which approaching the food magazine is followed by the sight of food, etc. This chain may be extended indefinitely by establishing explicit stimuli, such as the color of the key or the magazine light. While the development of these performances in the chain of responses depends ultimately upon the receipt of food, the actual stimuli which are manipulated and which, in fact, control the bird's behavior, are the changes in illumination.

Examples of Conditioned Reinforcement and Chains in Children's Behavior

The same process may be illustrated by a child standing at the door screaming because this behavior leads some personnel on the ward to open the door and take the child out to dinner. The origins of the chain of responses involved may be more complex than with the pigeon because of the long history involved, but the general dynamics of the behavior is completely parallel. Screaming at the door is followed by the appearance of an attendant opening the door, which is the occasion upon which the child may walk through the door and, with the attendant, go into the dining room. Going through the door to the dining room is the occasion upon which the child sits down at the table, which is the occasion upon which delivery of food makes possible eating. Here, as with the pigeon, while the actual receipt of food may ultimately determine the strength of the whole chain of performances, the critical conditioned reinforcers in the chain are in fact the events which determine many crucial aspects of the form of the behavior. Nor is it necessary to assume that ingesting food is the sole consequence maintaining the chain. The actual final reinforcer maintaining most of the behavior may, in fact, be a complex of consequences, including social ones in the dining room. It is not necessary, however, to analyze the total consequence of entering the dining room in order to study the effect of manipulating the prior parts of the chain. The reinforcing effect of a given complex of conditions in the dining room may be measured by the reinforcing properties of going through the door.

Chapter 7

Successive Approximations With Conditioned Reinforcers

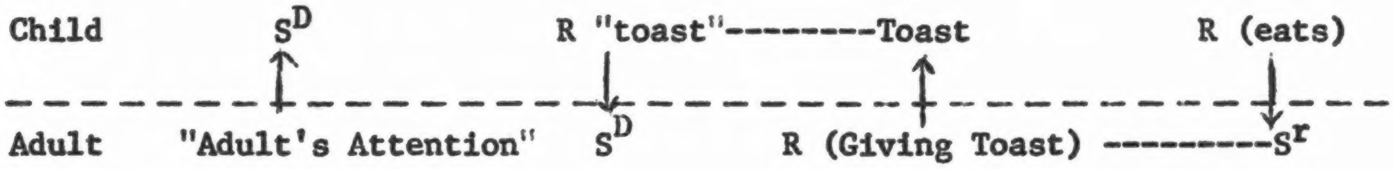
If we can assume, for purposes of analysis, a constant set of consequences for the child entering the dining room, the form of the behavior of the child at the door leading from the ward is determined by the specific consequences applied to the child's behavior by the attendant. For example, the child at the door may go unnoticed when he stands quietly, and the attendant may notice the child only when it screams. As a result, initial response in the chain begins to take a new form, screaming, because of the differential reinforcement. More and more intense screaming may be reinforced when the attendant is occupied with other matters, and only appears when the intensity of the screams increase to the point where their aversiveness makes the attendant's appearance at the door prepotent over whatever he is doing. Or, conversely, it would be possible to change the form of the child's behavior at the door by withholding the appearance of the attendant when the child is quiet. By arranging the appearance of the attendant analogous to a gradual program of "approximation" or differential reinforcement, it should be possible to produce very different forms of behavior, depending upon what contingencies are arranged. These performances are relatively independent of the consequences in the dining room which are ultimately maintaining the entire chain. Sometimes the form of behavior occurring at the door may be determined completely accidentally as, for example, when the door is opened, regardless of what the child is doing, but because of a special history,the child happens to be crying. The appearance of the attendant opening the door when the child is crying will maintain the behavior and increase the frequency of the likelihood that the child will be crying again the next day. This performance may be maintained indefinitely, even though spuriously. The fact that the opening of the door has no planned relation to the child's behavior does not alter the reinforcing effect of opening the door on whatever the child happens to be doing. Such accidental reinforcement occurs very widely in the emerging repertoire of the child. For example, once the infant's crying is reinforced by food brought by the parent, the infant cries as the feeding time approaches (because of past reinforcement and/or the direct effects of food deprivation), the placing of the bottle in the infant's mouth follows a vocalization with a high probability, and the subsequent increased frequency of crying may be maintained spuriously. It does not matter that the parent did not intend crying to be reinforced by (followed by) feeding. This accidental or "spurious" reinforcement is a result of conditioned reinforcers because these are the events which illustrate a major aspect of reinforcement--that it is essentially a temporal phenomenon. What behavior we "intend" to develop is less relevant than what behavior is followed by a change in the child's environment which makes possible the reinforcement of a response further along toward some important consequence.

The above examples show that the analysis of the behavior and the ability to control and change it becomes more powerful when we recognize that the child's behavior consists of a sequence of performances, each maintained by specific stimuli. To actually manipulate and control the child's behavior, the important events which need to be altered are the instant and immediate consequences of the behavior. The emphasis on the immediate effects of the child's behavior on the environment, particularly as these effects are occasions for further behaviors in a long sequence of behaviors, does not minimize the importance of the ultimate consequences of these performance sequences in maintaining the performance. These ultimate consequences are in fact crucial, but for purposes of analysis, the actual terms which are manipulated and studied in the analysis of behavior are the immediate consequences.

SOCIAL BEHAVIOR AND CONDITIONED REINFORCEMENT

Many chains of responses in the child's repertoire are possible only by the mediation of another adult. This characteristic is a very basic defining characteristic of social behavior: That the reinforcements ultimately maintaining the behavior of one individual occur as a result of the mediation of another. The mediation of a second organism necessarily implies a chain of performances. Most of the performances in human repertoires consist of verbal and vocal behavior which, in themselves, have little effect upon the physical environment, except insofar as they are stimuli which are the occasions upon which another individual may make possible some further effect upon the environment. The relevant reinforcing stimuli which need to be analyzed and controlled are the reactions of a second individual as the immediate and specific consequences maintaining the behavior of the first.

In his work on verbal behavior, Skinner (1957) analyzes a simple verbal sequence between a child and an adult in terms of the conditioned reinforcers maintaining both the behavior of the speaker and the listener. Consider the behavior of the child first, as it is diagrammed in the top line of the diagram.



In the presence of an adult, the child says, "Toast, please." This performance is followed by receiving toast from the parent which is the occasion upon which the child eats the toast. The delivery of toast reinforces the verbal request, or "mand," as Skinner defines this type of verbal response. For the adult, the sequence begins with the stimulus from the child's verbal response, "Toast, please," the occasion upon which the behavior of giving toast is reinforced by seeing the child eat the toast or, perhaps, because in the past the child has screamed aversively when toast was not forthcoming, and the adult gives toast in order to avoid the aversiveness of the possible tantrum. That this is social behavior may be seen by the interaction (represented by the arrows crossing the dotted line) between the two chains of performances occurring in the adult and the child. The behavior of asking for toast is under the control of the presence of the adult, since the behavior of speaking goes unreinforced in the adult's absence. "Toast, please" is a response emitted by the child, but for the adult it is a stimulus in whose presence the behavior of "giving toast" will be reinforced by seeing the child eat it. The child eating the toast maintains both chains of responses because for the adult seeing the child eat is a positive reinforcement because of a complex of reasons which need not be analyzed for the present purpose; and (2) the delivery of toast reinforced the verbal mand, "Toast, please."

An elaborate analysis of such a small verbal episode is neither trivial nor theoretical because all of the stimuli and responses which are designated refer to actual identifiable events either as responses of the child or the parent's repertoire or specific and observable consequences of these responses. The form and specific features of this simple social interaction could be altered almost arbitrarily by manipulating the specific consequences of any performance in the sequence of performances. "Asking for toast" could be weakened simply by the failure of the adult to respond on this occasion. The behavior of the adult in giving toast could be weakened (1) by a failure of the child to eat the toast, or (2) by a change in the relationship between the parent and child no longer making the child's "eating toast" reinforcing to the parent. The stagy-by-stage analysis of these two chains and their interactions also makes it possible to understand and control more subtle features of the separate performances of the adult and the child. The intensity and form of the verbal response "Toast" on the part of the child may be shaped and altered by virtue of a differential response of the parent, as was the case of the child standing outside the door in the example given above. The probability of the adult actually supplying toast depends upon many details of the adult's repertoire; as, for example, what other behaviors the adult is engaged in. The probability of the performance "Toast" being reinforced varies widely with the state of the adult from time to time, as for example, if the adult were under emotional duress. The differential characteristics of one adult from another (whether the adult is father, mother, or stranger) alter the probability of "Toast" being emitted because of their differential practices. If the parent withholds toast until the child emits strong forms of the response, as for example, shouting and whining, the form of the behavior gradually shifts in that direction. Or, if the consequence of giving toast leads to the child smearing food over himself and the furniture, the child eating the toast may be aversive instead of positively reinforcing, particularly if the adult is a compulsive housekeeper. In all of these cases, it is crucial to identify the instant and immediate consequences of each of the performances involved in the chain and analyze the subsequent consequence of each stimulus from which its control is derived. Simply identifying food as the reinforcement as asking for toast is not a sufficiently detailed analysis to account for the manner in which the specific forms of behavior arise and the manners in which the chains may become distorted or weakened.

Social Chains and Generalized Reinforcers. That the verbal response of the child may go unreinforced on many occasions has broad implications for the role of the adult in maintaining the child's behavior. Because so much of the child's behavior depends on the mediation of an adult, and because the probability of the child's behavior being reinforced depends crucially on the specific aspects of the adult's bearing, the response of an adult to the child comes to have special significance as a generalized reinforcer. The special reinforcing properties of a generalized reinforcer beyond those present in a simple chain of response comes about because a wide variety of behaviors all maintained by very important consequences to the child become possible only in the presence of the adult, and more specifically, on occasions when the adult has specific characteristics, as, for example, is attending, praising, smiling, not angry or frowning, not preoccupied, etc. For the young child up to the age of 2 to 3 years old, the parent (particularly the mother) mediates nearly every important environmental consequence maintaining the child's performance. This occurs largely as a result of the general immaturity of the human infant in comparison with other species. For the first 9-15 months of life, the parent is the sole agency on which the events responsible for the very maintenance of the child's life depends. Even later, when the child acquires more direct control over his environment (technically, acquires performances maintained by the direct effects on the environment, mediated by a variety of individuals, or unmediated by any organism), very substantial portions of its repertoire still continue to be maintained by parental reinforcement. Only in the presence of the parent is the performance, "May I have a cookie?" reinforced by the parent saying, "Yes" which, in turn, is reinforcing because this is the occasion upon which the parent hands the child the cooky. Similarly, "May I play with the Tinkertoys?"

Because these characteristics of the adult influence the child in respect to such a wide range of reinforcers and behaviors, they may affect the child without regard to any specific level of deprivation. The praise or attention of the parent is important for the child, even when he is not hungry, because there is likely to be some other behavior in strength whose reinforcement will depend upon the parents' mediation. In other words, consequences in the parental repertoires, such as attention, praise, smiling, etc., continue to be powerful reinforcing stimuli because they are a common element in many chains of responses leading to almost every important consequence maintaining the various elements in the child's repertoire. Such generalized reinforcing stimuli are crucial in the development of much of the social and, particularly, the verbal behavior of the child, and are the main means by which the adult exerts educational influences on the child in establishing new repertoires which do not have immediate practical importance for the child. The main reinforcer in teaching a child to comment on his own behavior is a generalized reinforcer involving parental attention, praise, good humor, etc., all of which are related in the child's past history to high probabilities of reinforcement of many important repertoires. Behavior such as "I am playing with blocks" in response to "What are you doing?" must be maintained by some form of generalized reinforcement. In contrast are performances like "Drink of water, please!" which are maintained directly by a reinforcer immediately relevant to a current level of deprivation. Of equal importance in the reinforcing effect of the generalized reinforcer is the nonreinforcement of significant elements of the child's repertoire when the parent is inattentive, frowning, angry, or preoccupied.

It may be seen, therefore, that the development of the generalized reinforcer is a complex behavioral phenomenon which depends upon the existence of many chains of behavior involving many different kinds of performances reinforced by many different kinds of consequences in the environment. As these various chains or performances go variously reinforced or unreinforced or, perhaps, occur with different probabilities of reinforcement, depending upon the particular state of the adult who mediates the reinforcers,these particular aspects of the adult come to have the special significance for the child's repertoire as implied by the term "generalized reinforcer."

DYNAMIC VARIABLES

Even if a performance is in the repertoire, dynamic aspects such as the history of reinforcement, delay in reinforcement, and the interaction with other performances will also all influence its frequency. One dynamic variable, already discussed, was the history by which an individual comes to sustain a large amount of behavior required for reinforcement. The same performance and reinforcer will produce widely differing repertoires depending on whether or not there is a gradual adjustment to the final state.

Delay in Reinforcement

Many primitive cultures, such as in Africa, do not require much behavior maintained by delays in reinforcement. For example, there are dock workers, who are paid by "the bag" for loading ships. These individuals perhaps could not sustain the performance if they were paid even daily. Even in the American culture, there are some social groups whose employment is limited to those situations where they are paid daily. The ability to sustain behavior whose reinforcement is delayed by considerable periods of time is a requirement for functioning effectively in most cultures. Few performances are immediately reinforced and the more complex highly regarded activities of the community involve very long delays. The novelist may work 6 months to several years without completing a product that represents his activities to the community.

The business executive makes plans that may be realized 2-5 years later. Complex repertoires, the analysis of which are beyond the scope of this section, are required to bridge the interval between the performance and the effect in the environment that maintains it.

Clarifying the Environment

Another class of behaviors occurs because it clarifies the environment rather than produces a reinforcer directly. The behavior of reading a map is an example from the natural environment in which one performance facilitates the reinforcement of another. The primary performance is that of travelling from one place to another and the reinforcement is arriving at the destination. The performance will not bring about arrival at the correct destination, however, unless it is narrowly under the control of the features of the terrain, roadway, and other sign posts. The behavior of reading the map is reinforced because it provides stimuli which makes it possible for the traveler to take the turns which will bring him to his destination. The experimental analogue of this kind of behavior has been studied in pigeons by a procedure in which the bird produces food by pecking on a key but has no cues available as to when his pecks will be effective. Hence, reinforcement is highly intermittent. A second key is provided, however, to clarify the environment. Pecks on this key produce stimuli on the first one which tell when pecking may produce food and when it may not. These performances are readily established and stably maintained so long as they facilitate the reinforcement of the food behavior.

Similar observing behaviors have a basic role in the everyday repertoire of almost any individual in any culture. There are very limited conditions under which most of the behavior of an individual may be reinforced but the circumstances correlated with this reinforcement are not always obvious. For example, the person looking for a lost object in tall grass needs to part the grass systematically if he is to find the object. The carpenter, to make a piece of furniture needs to make a sketch or blueprint which in turn will guide his movements and the person listening to some instructions will cup his ears, lean forward, or move closer to the speaker so as to increase the likelihood of being influenced by the stimuli.

An individual's own behavior is an event to which he can, in turn, attend. When a person engages in a performance there is no guarantee that he can describe the behavior he has just engaged in. Child-rearing practices of most cultures develop these kinds of behaviors very explicitly. The parent, for example, continuously asks the child "Where are you going?" "What did you do?" "Why did you do it?" The performances generated by the parents when such questions are asked are under the control of the person's behavior, and are means for getting him to be sensitive to and to notice his own conduct. Such repertoires are critical for self control and self management because a person cannot engage in performances to alter his own conduct if he cannot observe them.

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Chapter 7

Self Control

Self control refers to performances which change features in the individual's environment which in turn effect his behavior. As such, the self control behaviors are functionally analogous to performances which clarify the environment. Rather than produce reinforcers directly, these behaviors produce changes in the environment which in turn facilitate the reinforcement of other performances. Traditionally the area of self control emphasizes behaviors such as over-eating which lead to ultimate aversive consequences. The primary behavior is that of ingesting food which is positively reinforcing and strongly maintained but leads, in the long run, to the aversive consequences of being obese. Self control refers to actual forms of conduct which alter the relation between the individual's behavior and the environment which influences him so as to reduce the frequency of eating. For example, the design of the kitchen so that highly caloric foods are placed out of reach and fruits, vegetables, and milk within easy reach is a performance which somewhat reduces the frequency of eating high-caloric foods. The person who drinks several glasses of water just before going to a cocktail party is engaging in a performance which will avoid the aversive consequences of too rapid ingestion of alcohol.

Another class of self control involves the enhancement or facilitation of positively reinforced behavior. Some performances require long chains of sustained behavior and delayed reinforcements which potentially reduce the frequency of the performance to the point that many simple, immediately-reinforced behaviors are prepotent over them. Yet, in the long run, the reinforcements and the behaviors generated by the long, more-complicated chains of behavior are critical for the individual's adequate functioning in the environment. In this area, self control performances are those which may temporarily weaken the competing behaviors such as, going to the movies, or engaging in a bull-session in the case of the college student. Conversely the self control behaviors clarify the environment by way of providing conditioned reinforcers which step by step bring the long term positive reinforcement that will occur as a result of completing the extended sequence of behaviors to bear immediately.

The development of self control and self management are further examples of complex behavioral repertoires whose final development requires very specific histories of reinforcement. Just as the ability to sustain a performance requiring a large amount of behavior for reinforcement requires a slow adjustment from lesser requirements, the development of self control and self management also require a careful development of the complex behaviors paced to the individual's current level of activity. Many lesser kinds of self control are required in the repertoire of a college student before he can successfully sustain study behavior for an entire semester without feedback and competing with more primitive behaviors (immediate reinforcement, or psychoanalytically immediate gratification) such as going to the movies, dating, sports, and socializing with other students. Many situations requiring self management involve very long chains of complex behavior whose development requires a very careful history paced to the individual's current capability. The technical analysis of how long chains of behavior can be developed emphasizes the dynamic nature of the processes. The individual's performances need first to be maintained on short chains of behavior in which the performances are maintained strongly so that they may be prepotent over competing repertoires. Then the orders of magnitude needs to be gradually increased, paced with the development of the self control repertoires which will bridge the individual's current performance to the long term reinforcers. Many accidental arrangements of the environment may prevent the development of these self control and self management repertoires so that an individual cannot make contact with important reinforcers in the natural environment which require self control and self management. Conversely, those instances in which these delicate complex behaviors do emerge reflect a long history of experiences in which a very complex repertoire is established step-by-step in successive approximation, paced to the individual's current capability.

Educational situations in particular are examples of repertoires whose reinforcement is considerably deferred and requires self control and self management. When an individual takes a course of instruction, practices the piano, or rehearses the pronunciation of a foreign language he is engaging in performances which make possible repertoires whose reinforcement will occur long in the future. Furthermore, these educational behaviors involve a considerable number of performances before they achieve their significant effects.

Other examples of self management behaviors involve performances which actually alter the physical environment. Thus, the typist who adjusts her chair so as to increase the rate at which she can type, is engaging in one performance which makes possible the reinforcement of another. The individual who moves from one city to another to make possible a new kind of employment activity is engaging in similar kinds of self management.

AVERSIVE CONTROL

Proportion of Negative to Positive Reinforcement

A performance can occur because it produces some change in the environment which in turn makes possible some further behavior (positive reinforcement) or it may occur because it postpones or allows escape from some event (negative reinforcement). The proportion of a repertoire maintained by positive reinforcers and aversive stimuli is an important dimension for categorizing the repertoire because it is the positive reinforcers which are probably ultimately responsible for maintaining an .individual's behavior. Avoidance and escape behavior (negative reinforcement) may be thought of an housekeeping operations which make possible the successful maintenance of the positively reinforced repertoire. Behavior occurring because of escape from aversive stimuli, therefore, produce the overall frequency of positive reinforcement of the individual's total repertoire. The greater the amount of behavior which the individual expends in reducing aversive stimulation the lower the overall frequency of positive reinforcement will be. It is problematical whether a repertoire consisting entirely of escape and avoidance behavior could be maintained stably over a long period of time in any kind of normal contact with a social environment. As greater proportions of an individual's repertoire are involved in postponing and avoiding aversive stimuli, the overall schedule of reinforcement is one in which a very large amount of behavior needs to be emitted for each positive reinforcement. The extent to which an individual's repertoire is involved in aversive control bears on the overall schedule of positive reinforcement and represents a basic dimension for characterizing the repertoire.

The Nature of the Aversive Stimuli Controlling Behavior

A description of an individual's repertoire would include a classification of the kinds of aversive stimuli controlling his behavior and the relation of these stimuli to the positively reinforced repertoire. Aversive stimuli may be derived from their relation to the positively-reinforced repertoire or may derive their reinforcing effects phylogenetically, as with loud sounds, extremes of temperature or physical insult to the body, such as physical trauma or infection.

Non-Derived Aversive Stimuli. The nociceptive stimuli may be classified as those so closely tied to the characteristics of the physical environment that their reinforcement is inevitable, such as withdrawing the hand from a hot surface or avoiding a fall from a high place, or bumping into an object while walking. A second category are these aversive stimuli applied by another person, as in corporal punishment, where the aversive stimulus is related to behavioral processes in other individuals who apply the aversive stimulus.

Aversive Stimuli Derived from Positive Reinforcement. Aversive stimuli, such as criticism, fines, ostracism, incarceration, anger, etc. derive their aversive properties because they are the occasions upon which there is a discontinuation of normally positively-reinforced behavior. In practice, it is difficult to functionally distinguish direct aversive stimuli (nociceptive stimuli) applied by persons from the withdrawal of positive reinforcement because both may occur simultaneously. A parent, for example, who spanks a child is also less likely at this time to apply positive reinforcement. In most cases, it is difficult to distinguish how much of the effects of the spanking come from the physical trauma and how much from the withdrawal of positive reinforcement. Conversely, even corporal punishment may serve as a positive reinforcer, if a spanking becomes an occasion upon which other behaviors are reinforced. Such a state of affairs would occur when a parent gives a child gifts only after a spanking to escape the guilt counter-control by the child. As in almost every case, the classifications of the aversive stimulus depends upon a functional analysis of the contingencies associated with it, rather than a topographic description.

With stimuli which are aversive because they are the occasion upon which the reinforcement of other behaviors may be discontinued or reduced, classification is closely tied to a description of the positive repertoire in general and, in particular, the specific behaviors that are interfered with. For example, the functional significance of a change in facial expression from a smile to a frown depends upon the practices of the smiler compared with the frowner. In most parts of the American culture, frowning is a potentially aversive event because it is associated with a low inclination to reinforce upon that occasion, and an evaluation of the functional significance of a frown will critically depend upon an enumeration of those behaviors of which reinforcement is discontinued upon the occasion of a frown. The correlation is by no means inevitable, however, as with spanking. A particular individual's "bark" may be "worse than his bite," so that a frown may have no aversive consequences, except insofar as there is generalization from other similar individuals who are disposed to punish. It is possible to imagine an entire culture in which the contingencies associated with frowning and smiling might be completely reversed. Those individuals who are disposed to punish may smile because they, in general, attenuate the effect of their punishment on those individuals who are disposed to reinforce frowning. A gambling situation is likely to have this state of affairs, with the loser frowning as he gives the money to the winner. An advisor engaging in behavior for the benefit of an advisee might frown as he attempts to solve a difficult problem.

Finally, a stimulus which is aversive because of its correlation with loss of positive reinforcement may be classified in terms of the amount of positively reinforced behavior that is discontinued, as well as the relative proportion of repertoire that is interfered with as a result of the aversive control. Criticism is an aversive event to the extent that it implied that the listener will not engage in behaviors of the same form. The aversiveness of criticism would appear to depend upon how much behavior it preempts. Thus, many criticisms will influence trivial aspects of an individual's behavior. For a public speaker or an actor, however, criticism of his performance represents non-reinforcement of a very major portion of the person's total repertoire. Conversely the effect of criticism on the individual's repertoire will depend on how much positively reinforced behavior is present. A very durable repertoire diversely maintained by many reinforcers will suffer little from criticism of a minor element. An impoverished repertoire containing meager forms of conduct will suffer serious loss from even minor criticism.

The preceding categories represent very different kinds of relations between the behavior of an individual and the possible aversive outcomes in his environment. Thus the evaluation of the particular kinds of aversive control influencing the individual's repertoire must take into account the nature of the aversive stimulus and how it derives its aversive properties.

Suppression by a Pre-Aversive Stimulus

The stimuli which characteristically precede an aversive stimulus may often be more disruptive than the aversive stimulus itself. As with most kinds of aversive control the form of the pre- (conditioned) aversive stimulus is arbitrary. The relation to the aversive stimulus determined how it influences the individual's ongoing operant behavior. The pre-aversive stimuli may be in the external environment as, for example, an audience or a dentist's office. A group of people at a formal party may serve as pre-aversive stimuli because groups of this kind are the occasions which may precede criticism, or a situation in which no behavior is reinforced, as for example, a person who is not able to speak effectively at a dinner party. Or the pre-aversive stimulus may be in the individual's own behavior, as when particular performances are punished (followed by an aversive stimuli). The incipient tendencies to engage in these behaviors and the behavior itself becomes an event preceding an aversive stimulus. Both kinds of disruptions by a pre-aversive stimulus may be responsible for a discrepancy between the existing repertoire of the individual and the repertoire which the milieu can potentially support.

Since suppression of ongoing behavior by a pre-aversive stimulus implies a repertoire which is concurrently supported by positive reinforcement its suppression or disturbance by the pre-aversive stimulus may be as much a function of its inadequate maintenance by positive reinforcement as by interference by the pre-aversive stimulus. In evaluating the significance of missing items from a repertoire, it is necessary to take into account simultaneously the general strength of the behavior as a result of the reinforcer maintaining it as well as the disruption by the aversive stimulus. Easily suppressed behavior is probably weak to begin with. With well-maintained behavior, punishment needs to be of large magnitude and virtually continuous to effectively disrupt or suppress it.

The disruption by a pre-aversive stimulus is a general process which may categorize behavioral pathology independently of the particular circumstances or cultural background involved. The kinds of aversive stimuli that underlie the disruption by a pre-aversive stimulus, and the particular operant repertoire that is disrupted may differ from individual to individual and from culture to culture, but the discrepancies from the behavioral potential of the milieu may be very similar.

Pre-aversive stimuli may sometimes increase the rate of the ongoing operant repertoire, rather than suppress it, when the ongoing behavior is predominantly avoidance and escape responding. While the major result is ostensibly different in two cases (an increased rate of responding in the presence of the pre-aversive stimulus in the case of the negatively reinforced ongoing repertoire), the major effect upon the total repertoire is similar. The high rate of the avoidance behavior preempts other behavior which might have been supported by positive reinforcement, just as the suppression or distortion of positively-reinforced behavior prevents its reinforcement. The classification of the effects of pre-aversive stimuli, therefore, is based also on the nature of the reinforcers maintaining the ongoing repertoire.

PUNISHMENT

Aversive stimuli in the environment normally lead to avoidance and escape behaviors since they reinforce any performances which terminate or avoid them. The result therefore in the natural course of affairs, is a low frequency of aversive stimuli affecting an individual's repertoire. Some aversive stimuli, however, follow particular kinds of performances because of the relation of the performance to the physical environment or because of social practices. Such aversive outcomes would ordinarily be avoided except that the performances are also positively reinforced. Ordinarily the conflict between a positively reinforced performance and its aversive outcome can sometimes be resolved by an altered form of the performance that simultaneously produces the positive reinforcer and avoids the aversive stimulus. Such would be the case for example, when an individual puts on warm clothing to go skiing or ice skating. The kinds of situation in which punishment occurs may be described as a situation in which there are two simultaneous consequences of a performance. (1) It may lead to strong positive reinforcers, as for example, the race car driver racing for a large monetary prize, or the hungry child reaching for the cooky jar, (2) the same performance may have an aversive consequence, as with the possibility of accident and death in racing as a result of the natural relation between the reinforced behavior and the physical environment, or the intervention by the parent, because the child's positively-reinforced behavior has aversive consequences for the parent.

To summarize, the classification of the kinds of punishment which occur in an individual's repertoire will depend therefore on classifying how the performance is maintained by positive or negative reinforcement, the kind and degree of the aversive consequence produced by the behavior and how it is applied.

Chapter 7

Avoiding Punishment

The kinds of performances which are required before the aversive control will not occur when punishment is possible are more complex than in escape and avoidance, where the performance need only terminate or postpone the aversive stimulus. Not only must the performance avoid or escape the aversive stimulus that occurs as a result of punishment, but it also must retain enough of its essential form so that it will continue to have its original effect. The race car driver simply quits racing, or the child leaves the room where the cookies are if the positive reinforcement maintaining the performance no longer operates. If the operant consequences of racing or reaching for the cookies, however, continue to sustain the performances, then the only possibilities of avoiding aversive control is a shift in the form of behavior so that it is simultaneously effective in achieving the positive reinforcer, and avoiding the aversive stimulus. Thus, the race car driver learns techniques of driving which allow great speed,but yet maximize safety. The child develops performances which are effective in obtaining the cookies, yet will not be punished.

The remaining case is the one where punishment continues to occur despite the aversive stimulus which followed inevitably. The very nature of some performances guarantees that their punishment is inevitable as for example, some parental environments where the cooky jar is kept under close surveillance and where the practices of punishment are very strictly adhered to. In these cases, the operant performance may occur from time to time, in spite of its aversive consequences. The effect of punishment will depend critically upon its schedule of application, the kind of aversive stimulus as applied, its relation to the individual's repertoire, and the strength of the positively reinforced behavior. It is impossible to determine in advance and without a detailed analysis of the exact performances whether the aversive consequences of an operant performance will totally suppress it if there is no alternative form which can achieve its operant reinforcement without the aversive stimulus.

The major significance of punishment, aside from its implication for the nature of the positive reinforced repertoire, lies in the escape and avoidance behavior it generates. When we punish a child for certain kinds of speech, intending to reduce their frequency, we do this by negatively reinforcing some other behavior prepotent over the behavior we intend to eliminate. Thus, the means of suppression by punishment is the reinforcement of behaviors prepotent over the punished ones. The child in front of the expensive bric-a-brac puts his arms behind his back to prevent the parental punishment that follows from playing with it. The child in the classroom bites his lips, puts his hands over his face, or turns away from the situation which is making him laugh in order to avoid the teacher's censure. Thus the clinical significance of punishment lies in the performance it generates which may be prepotent not only over the particular performance which is punished but many other forms of conduct which the individual's environment could, at a later time, potentially support.

Chapter 7

APPLYING GENERAL CLASSIFICATION OF BEHAVIOR TO CLINICAL PHENOMENA

The detailed analysis of the repertoire of one autistic boy will be presented in Chapter 9 as an example of how the general processes described in this chapter might be used for clinical description, diagnosis, and classification. A more general discussion of clinical depression as a broad clinical entity will serve as the transition to the fine grain technical description of Chapter 9.

Clinical Depression

A clinical depression is a convenient kind of behavioral pathology to introduce general behavioral processes because it so clearly emphasizes the frequency of various items of conduct in the individual's repertoire.

Clinical Description

Clinical depression is usually defined as an emotional state with retardation of psycho-motor and thought processes, a depressive emotional reaction, feelings of guilt, self criticism, and delusions of unworthiness. These qualities all describe quite complex performances with which the individual characteristically interacts with his environment. The emotional state refers to the pervasive changes in the entire repertoire rather than one particular island of difficulty. The retardation of psycho-motor and thought process refers to the decrease in the rate of occurrence of the person's physical as well as verbal and intellectual activity. Feelings of guilt, self criticism and delusions of unworthiness reflect the by-products of aversive control and indicate that a substantial part of the individual's repertoire is controlled by the avoidance and escape from aversive consequences or by-products of an aversive stimuli rather than direct reinforcing effects on the environment.

The clinical definition allows the identification of a depressed person and even characterizes its repertoire in detail. Yet, the actual behaviors referred to by these clinical descriptions are of more substantial use in classifying the behavior of the individual in terms of general processes of behavior. The clinical description provides a target repertoire about which we are concerned and the objective technical language about behavior provides a means for describing it.

Behavioral Description of a Depressed Person. Looking broadly at the total repertoire of the depressed person we see as our major datum a reduced frequency of many behaviors in which the person normally engages (Skinner, 1953). He sits silently for long periods, even staying in bed all day. While he may answer questions, ask for something, or even sometimes speak freely, the overall frequency of speaking is very low. Certain kinds of verbal behavior may seldom occur, like telling an amusing story, or writing a report or letter. Complaints or requests for help may be the bulk of the verbal repertoire. Frequently, most of the missing performances are potentially in his repertoire. He has, in the past, dressed properly, traveled to work, completed his job, even written successful books. The essential fact is that the frequency of these performances is now depressed and their failure to occur now is causing trouble for him as well as for various other persons, such as his spouse or employer, whose behavior, in turn, depends on his behavior.

Bizarre and Primitive Behavior. Bizarre or primitive behavior, sometimes called psychotic symptoms, may be a prominent part of a psychosis, largely because it is annoying and disruptive to those around the psychotic person. The individual may repeatedly engage in simple repetitive acts which interfere with or annoy others, and which have no functional relation to the accepted environment. He may talk excessively without regard for a listener, he may become incoherent, or he may repeat hand gestures over and over. Similar psychotic symptoms are common with schizophrenic or autistic children (Ferster, 1961). The autistic child engages in simple repetitive acts and rituals because there are no other significant behaviors in his repertoire. Whenever the child learns to deal successfully with the normal environment we find that the new repertoire preempts primitive behaviors.

Such bizarre behavior actually occurs with the average person, particularly when most of his repertoire cannot occur, as for example, at a compulsory conference. Even though the conference speaker does not engage him the listener must still remain, and appear to be, under the control of the speaker. One person may be seen to rub a spot on the table repetitively; a second doodles. A third person may repeatedly scratch his back, touch his forehead and stretch, and so on. The doodler in the conference room is engaging in behavior which is parallel to that of the psychotic because the bizarre behaviors occur because there are no other kinds of conduct. While these bizarre or annoying behaviors may have a very high frequency, they should not distract us from the more important fact that they are occurring in the place of those performances which define a normal interaction with the environment.

Describing the Repertoire of the Depressed Person With General Principles of Reinforcement

If the main feature of clinical depression is the reduced frequency of certain behaviors under normal control by the environment and an increased frequency of other behaviors, mainly those associated with aversive control, the first task is to determine how the basic principles of reinforcement may contribute to these increased and decreased frequencies.

Schedules of Reinforcement

The preceding text has already described the way in which a requirement of too many performances per unit of effect on the environment may reduce the frequency of a performance. Such reduced frequencies of behavior will in general have limited effects of the repertoire if they concern one performance from a strong and durable repertoire. When the performance constitutes a substantial part of the individual's repertoire, however, a disruptive schedule of reinforcement may have a broad, even, emotional result. Even though the schedule of reinforcement may not be a sole cause of a clinical depression, the reduced frequency of the individual's positively reinforced repertoire that it may produce certainly weakens the repertoire so that it is more susceptible to other kinds of disruption.

The Pre-Aversive Stimulus

Pre-aversive stimulus, as described earlier in this chapter, may have a profound effect in weakening an individual's on-going operant behavior. This is particularly true when the individual's own conduct serves as the pre-aversive stimulus so that he in effect carries his aversive environment around with him. As with other forms of aversive control, however, the classification and the relevance of the performance to behavioral pathology has to be judged in a context of the rest of the individual's positively reinforced repertoire. The disruptive effect of the aversive stimuli can come from the weakness of the positively reinforced repertoire and the absence of collateral repertoires such as self control as well as from the aversive stimulus itself. A durable, strongly positively reinforced repertoire, is much more easily disrupted by an aversive stimulus than a strong one. The question also arises as to why the aversive and pre-aversive stimuli do not reinforce (negatively, by removal) the forms of the positively reinforced operant behaviors which can escape them. The lack of these self control and self management behaviors is a form of incomplete behavioral development. These performances, in turn, probably depend on the underlying positive reinforcement repertoire.

Stimulus Control

Sudden changes in the environment may virtually denude an individual of his repertoire. The secluded elderly spinster lady, for example, may lose her entire repertoire on the death of a close companion because each person's behavior was narrowly under the control of the other. The close interpersonal control in the case of the secluded lady is an extreme case but the same process may operate in a wide range of circumstances and in varying degrees. Less extreme forms of stimulus change occur as a result of the death of a spouse, or a close relative, or a change in physical location.

Changes in the Environment in Old Age. Aging represents a similar sudden change in the environment which may cause a loss of behavior. The man who retires from his job suddenly finds many of the conditions which supported the reinforcement of much of his repertoire no longer present. The resulting loss of behavior is very closely analogous to clinical depression.

The aging person may lose behavior because physical changes no longer make it possible for him to act on the physical and social environment. Just as the adolescent may fail to develop new behavior during the period of his physical growth, the aging person may lose behavior because physical changes no longer make it possible for him to act on the physical and social environment as he did in the past. The athlete is the extreme case of someone suddenly unable to engage in one of the most important performances in his repertoire. He must develop new repertoires, within the limits of his physical capacity, under the control of a new environment. Although aging does not produce such dramatic changes in the average person as it does in the athlete, the later years are times when new performances under the control of new reinforcers must emerge. Decreased physical activity reduces the amount of food necessary. The level of sustained activity on the job has to be reduced, especially strenuous exertion. Disease may limit the range of performance that it is possible to maintain; retirement itself may impose an even more drastic change in the older person's environment than the physical changes resulting from age itself. To continue the person's interaction with the environment during retirement a new repertoire needs to be successively approximated. The transition depends on whether the retired person has non-professional behaviors which are effective in producing reinforcers in the retirement environment.

Changes in the Environment in Adolescence. Adolescence represents a sudden change in the environment of a different sort. During the rapid physical and biological growth and development of adolescence we require an ever increasing complex repertoire from the youngster who in the past achieved his important effects on the environment simply and easily. The youngster now has to work for money; his social interactions require new complex skills and large amounts of behavior; the educational institutions demand larger and more sustained performances with delayed reinforcement, and sexual maturity requires an elaborate operant repertoire before any behavior may be reinforced. When the transition is successful it represents a wonderfully subtle example of successive approximation of a complex repertoire. Each increment in the child's repertoire prepared him for the next until the complex repertoire necessary to deal with the adult environment is achieved.

When the process is unsuccessful, however, the community requires behavior more appropriate to the youngster's physical development than to his behavioral development. Slack (1960) for example, has discovered juvenile delinquents who steal in a department store, with money in their pocket, simply because they cannot sustain the longer behavior sequences needed to get a clerk to ring up the purchase. Many accidents in the environment may temporarily stop the behavioral development of a youngster so that he loses contact with the reinforcement contingencies that the community is likely to provide. Accidents parallel to those of the adolescent can be constructed in animal experiments, for example, in the transition from one schedule of reinforcement to the next. If a pigeon who has been reinforced every time it pecks is suddenly reinforced only after every 150 responses, the bird would soon stop pecking altogether and even starve to death. The same bird could sustain its performance, even at larger requirements, if the number of pecks required is increased a step at a time, paced with the bird's performance at smaller requirements. Many of the technical properties of schedules of reinforcement give information about how behavior can be maintained or weakened during transitional states.

Relation of Positive Reinforcement to Aversive Control in the Total Repertoire

The proportion of an individual's behavior maintained by negative rather than positive reinforcement will influence his susceptibility to disruption by a change in the environment. Consider, for example, a man whose behavior is disproportionately maintained by escape and avoidance rather than positive reinforcement. His job is motivated by reducing the displeasure of his employer. He empties trash at home to terminate his wife's nagging and he works for money to prevent a calamity in his old age. Sudden removal of all of the threats may expose the meagerness of his repertoire. If placed in a free work environment, like a research scientist or a free lance writer, this man might have such an impoverished repertoire in relation to positive reinforcement that he would be effectively denuded of behavior unless there was an effective transitional environment. The man who works to escape his employer's displeasure appears, at least topographically, similar to the man who works because the job accomplishment is rewarding. Yet the performances are functionally different because the reinforcers maintaining the behavior are different.

Summary

The preceding analysis of depression emphasizes a loss of positively reinforced behavior and an increase of aversively controlled behavior as the common denominator among depressed persons. Any and all of the general processes of reinforcement are means for increasing or decreasing the frequency of performances in the various behavioral classifications. No one of the processes alone is likely to be responsible for a change in the total repertoire. The frequency of the performances in the depressed person's repertoire is simultaneously a function of many variables. Every process studied in the animal laboratory, using the frequency of a simple arbitrary performance, tells something new about how the environment may influence the frequency of occurrence of behavior. In any given case one process such as intermittent reinforcement may be prominent; in another case extinction may be the prominent feature. Nor are we likely to find a single cause of depression in the sense of a tumor which can be excised, a defective brain center which can be revitalized or a psychic mechanism which can be released, even though each of these may be a potential agent for weakening behavior. Given an intact organism, the frequency of the operant repertoire is determined by its interaction with the environment. General states of the organism such as systemic effects of hormones and steroids or the structure of the nervous system are parameters of the behavioral processes. We have the behavior of the organism reinforced, shaped, and determined by its interaction with the environment, and modified by the parameters of the physiological substrate.

A loss of positively reinforced behavior may occur simply because the relevant performances have never been established in the repertoire In this case, particularly without a high frequency of aversively controlled behaviors, we are more likely to speak of an educational deficit than a depression. Such a person may have some of the behavioral features of a depressed person in many ways, but the repertoires have very different functional significance. In the one case we try to reinstate a previously intact repertoire; in the other case an environment is required which will make contact with the existing behavior and successively approximate the missing performances.

ABNORMAL BEHAVIOR

It should be noted that none of the performance classifications defined above involve terms like "abnormal," "deviant," or "pathological," but rather express a degree of a deviation or discrepancy from the practices of the community. The current clinical classifications of behavior as "abnormal" or "pathological" lead to some discrepancies when applied to a functional analysis of behavior along the lines of the classification system described above. Some very gross discrepancies between an individual's behavior and the potential of the milieu go by essentially unnoticed. Examples are the chronically unemployed person who in other ways does not cause the community any difficulty, and the quiet child in the rear of the classroom, whose behavior does not cause the parent or teacher any difficulties, but yet who is barely functioning in the educational system.

We may better understand our present classification system by making a functional analysis of the behavioral practices of those individual or agencies who designate people as being "abnormal." The behavior of those individuals or agencies engaged in the practices of altering the behaviors of the "deviant" individuals are themselves a function of consequences in the milieu in much the same way as the behavior of the deviant individual. Moreover, the specific conditions and practices which dispose the community to label a given individual as "deviant" or "abnormal" provide a useful definition of abnormality by a specification of the particular practices that are involved. The conditions (consequences, reinforcers) which maintain the behavior of individuals or groups of individuals who attempt to alter the behavior of particular persons in the community involve diverse kinds of behavioral control.

We may better understand our present classification system by making a functional analysis of the behavioral practices of those individuals or agencies who designate people as being "abnormal" in the course of attempting to alter their behavior. The behavior of those individuals or agencies engaged in the practices of altering the behaviors of the "deviant" individuals are themselves a function of consequences in the milieu in much the same way as the behavior of the deviant individual. Moreover, the specific conditions and practices that dispost the community to label a given individual as "deviant" or "abnormal" provide a useful definition of abnormality by a specification of the particular practices that are involved. The conditions (consequences, reinforcers) that maintain the behavior of individuals or groups of individuals who attempt to alter the behavior of particular persons in the community involve diverse kinds of behavioral control.

The individual himself may define his behavior as abnormal by engaging in practices whose main effect is to alter his own behavior, for example, psychotherapy or education. In such a case, other members of the community may or may not be disposed to alter this individual's behavior, depending upon whether the factors listed below are operating.

Individuals in the community may attempt to alter the behavior of a person when the expanded or altered repertoire that is attempted is a reinforcer for the individual or agency concerned. The teacher in the educational system, for example, is disposed to alter the behavior of the student because an enlarged repertoire of the kind specified by the educational system is the occasion upon which the teacher is successful and may, on his own part, benefit. The employer may attempt to alter the behavior of an alcoholic employee because the alcoholism is interfering with the performances he required in the conduct of his business. A government agency may attempt to retrain the unemployed or find the conditions responsible for absenteeism because increasing the economic potential of the community makes possible other reinforcers for the individuals in the agency.

Individuals or agencies may attempt to alter the behavior of an individual in the community when that individual's behavior leads to aversive consequences for those around him. The person with paranoid delusions or a high uncontrolled rate of verbalization interferes with the ability of the people in his immediate environment to communicate with each other. An incontinent person requires someone to clean up after him. The failure of an individual to contribute to his own maintenance leads to a loss of money in his immediate and larger family. Criminal behavior leading to loss of other persons' reinforcers, or a direct assault, also constitutes an aversive stimulus. Lying, hallucinations, paranoid delusions will, under a wide variety of conditions, lessen the ability of the community around the person to function properly. Some of these conditions have been discussed by Goffman (1964). The general effect of all of these behaviors is that they prevent or reduce the reinforcement of behaviors of members of the community and hence function as aversive stimuli that can potentially maintain escape and avoidance behavior.

It is impossible, however, to make a general statement about the aversive consequences of any particular kind of behavior. The effects of identical discrepancies between the behavior of the individual and the performances which are potentially maintained by the environment may be very different in two different communities. The disrupting effects of particular kinds of behavioral discrepancies, such as hallucinations or profound behavioral deficits, depend upon a concurrent analysis of the community in which the person lives and the specific performances interfered with. A person who is a "patient" in an urban family may be a functional member of the family on a farm. A retarded person, for example, will fit more easily into a rural than an urban community because the rural milieu demands less complex behavior and provides reinforcers for routine, monotonous labor of a simple sort. Conversely, behavior that may seriously disrupt a family during the confined living in a winter farmhouse might have less serious consequences in an urban environment, where the members of the family spend less time in the house. The Skid Row section of a community is an example of an environment in which individuals who would markedly interfere with other environments and be labeled as "abnormal" can exist without extreme disruption of their environment.

CHAPTER 8

A DETAILED CLINICAL, EXPERIMENTAL, AND BEHAVIORAL DESCRIPTION OF A SINGLE CHILD, KENT

This chapter continues the task of the Chapter 2 which described the mode of collaboration between Jeanne Simons, a clinician, and C. B. Ferster, an experimental psychologist. The point of contact between the two behavioral experts was direct observation of the child's actual conduct. This chapter provides a specific example by describing the development of one child based on detailed observation of his behavior. The detailed, factual and direct observations of the child's behavior are the referents for both the clinical terms and the general principles of behavior. They provide the bridge between experimental and clinical concepts. The primary data are a series of detailed, almost daily observations of the child taken from the direct observation of trained observers such as John L. Cameron, Jeanne Simons, C. B. Ferster, Charlotte Farrand, Mary Carol Perrott, and the Linwood therapists, and video tape recordings of the children. The data is treated in three parallel tracks. The primary focus is on the clinical concepts taken partly from psychoanalytic theory and the descriptive procedure by Ruttenberg et al (1966). These concepts are arranged on the same page with the direct observations of Kent's behavior in "plain English." An appendix to this chapter contains all of the descriptions of the child for the reader who requires more detail. In this way, the reader who has no clinical experience may refer back to the actual details of conduct of the child which is being described by the clinical term, and understand the same behavioral processes as the trained clinician. For the reader experienced in general principles of reinforcement, the description of general processes using behavioral language may help indicate what aspect of the child's conduct the clinical concepts highlight. For the clinical expert, these behavioral descriptions may also serve as an example of the way in which behavior principles may be used to describe the general aspects of clinical phenomenon.

The categories do overlap somewhat, however, since this writer as well as the project staff became so familiar with the several languages that it was impossible for one manner of expression not to be influenced by another wherever it was useful. As a result, the direct description for behavior tends to reflect reinforcement concepts language because they are such a simple way of describing events even in plain English without technical language. Conversely the operant reinforcement summaries tend to emphasize the kinds of behaviors highlighted in the clinical summary.

CLINICAL HISTORY OF THE CHILD

Pre-admission

Kent was diagnosed at 3 1/3 years of age at the Georgetown University Hospital as psychotic without obvious neurological impairment.

The primary symptoms failure to speak, inability to relate to people and bizarre behavior toward people and objects were present since birth and slowly getting worse.

He did cooperate with testing so there was no estimate of intellectual ability. During a brief therapy period Kent related mostly to objects, although a small amount of interpersonal behavior was seen toward the end of the therapy session. Diagnosis: a psychosis with many autistic features; some progress toward a symbiotic adjustment.

October 19, 1966, Dr. Leo Kanner confirmed the earlier Georgetown diagnosis of an autistic child who showed signs of readiness to accept approaches from others. During Kent's intake examination at Linwood, Dr. Kanner stated that, "Although there was eye contact, it was more a matter of curiosity than a matter of relationship. Physical contact did not seem obnoxious to him and he reacted to the pin prick[1] in a manner which included me as a person rather than dealing with a depersonalized hand."

Kent's behavior during his pre-admission session at Linwood showed him to be a remote child, unaware of all the other children in his environment. Dr. Schultz compared Kent with an infant, reacting to whatever was dangled above him and enjoying primitive body contact. Jeanne Simons observed "the autistic characteristics of isolation and remoteness."

Clinical assessment of Kent after a Brief Period at Linwood--December 1966

Kent's early behavior at Linwood evidenced some of the classical symptoms of the autist: aloneness; remoteness; not being aware of his body; not feeling pain or cold; and being unaware of people. As with other new children, minimal demands were placed upon Kent during his first week.

Although Kent was remote, he did not always reject physical contact and occasionally looked directly at people, but fleetingly. He usually averted his gaze if it were returned.

Change disturbed Kent. When he was indoors he objected to going outside, when it was time to return inside, he wanted to remain out. His days were spent stretched out on the floor usually at the door-sill or sitting quietly in a corner, ignoring both people and activities. When someone entered, he had to be moved aside like an inert object. He remained inert even if a child accidentally stepped on him.

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[1] Dr. Kanner pricks the back of the child's hand, without warning, with a straight pin.

His expression was quite meager, without any directed, differentiated communication. He had a small variety in facial expression such as smiling, babbling and crying, but these were infrequent.

Eating was the primary performance in Kent's repertoire. Sometimes he would arrive at Linwood with a string which he manipulated using two fingers in complex patterns. His occupation with the string often continued for long periods of time. When outside, Kent's sole activity was collecting a mound of dirt which he would rub and sift through his fingers.

Kent was not toilet trained when he came to Linwood, and he was not reactive to being soiled or wet. There were sleeping difficulties. He sometimes remained up and active most of the night although without crying or upset.

The followingare Dr. Kanner's notes following his evaluation of Kent on April 29, 1968, after Kent had been at Linwood for 5 months.

"I saw Kent more than a year and a half ago, at which time he was not quite five years old. When I saw him today, again, at the age of 6 years and 4 months, I think that I can see a great deal of things that happened to this child on the positive side. If one were to rely entirely and exclusively on formal testing, one would have to say that there has been no noticeable difference but any formal testing would be very deceptive at the present time and would be for some time to come. The child does have sometimes fleeting and sometimes a little more persistent eye contact and sometimes none. He does initiate play activities which are fleeting and showed a variety of types of behavior in the short time that I saw him today. He could at one time lie face down and hide, but when an adult took his hand, he would stand and again move about the room. He would sometimes run away from contact and other times come for it. He could jump up and walk around on the table with a somewhat exhibitionistic attitude and play. Then I would say he would neither lose nor gain interest but not know what to do next, accepting help from others, and would go promptly into another activity in the same sort of way. He will approach a person very closely face to face, and very soon would be away to some other pursuit. On the whole, however, there is much more of an awareness of and interest in other people and still sort of, I could describe it best, as a wobbliness of contact. It is fortunate that this child is only six years old therefore will have an opportunity to be at Linwood for quite some time, and I think that if not my optimism, ameliorism of a year and a half ago still persists. This child has opportunities for accepting warmth more and more, and will learn to respond to it more consistently than he does now, and even now he has made quite a bit of progress compared to the time when he first came here."

Chapter 8

RELATEDNESS: SHIFTS IN THE NATURE AND DEGREE OF RELATEDNESS TO HUMAN BEINGS

4/19/67 - 9

Clinical. Kent attends to JS mostly in conjunction with oral gratification, i.e., the cooky bits. He is aware that something has to be done in terms of the environment to satisfy his wants, and he attempts to manipulate JS (hand) as a thing necessary to release the tension in obtaining his need.

Operant. Handling the keys is reinforced by the noise and the physical movement it produces and pulling at JS's hand is reinforced by the sight of the cooky. There is no evidence that JS cues any behavior different than any of the physical objects. Physical contact with JS, previously an aversive stimulus, is now a reinforcer. The emotional by-products as in the gurgling and smiling is collateral evidence of the reinforcer.

Observation. JS placed the ball in the cupboard and put a key ring on the table in front of Kent. He reached for the keys, touched them and picked them up. JS had a piece of cooky in her hand and opened her fingers so Kent was able to see the cooky. When she asked Kent to give her the key, he continued to handle it, vocalizing softly and then attempted to pull her hand open with his fingers. JS kept her hand closed and Kent continued to dangle and tap the keys on the table.

4/19/67 - 4

Clinical. Kent evidences positive acknowledgement of JS's presence by his smile, gurgling and toleration of close physical contact. This is quite in contrast to his earlier patterns of imperviousness to other human beings.

Operant. JS produces two performances: taking the bit of cooky from her hand and eating it and contacting her physically was previously an aversive stimulus. They are positive emotional by-products as in the gurgling and smiling.

Observation. After JS and Kent had been engaged in the key and ball activity...she gave him a cooky saying, "That was very good, Kent," cuddling against him by putting her arms around him and her head near his. Kent gurgled, similar to the sound a baby would make and didn't pull away from her body and smiled.

4/23/67 - 12

Clinical. A shift from primary toward secondary process with ego structural development is indicated in Kent's behavior. Kent is reactive to JS's movement and singing, and he has relinquished the immediate satisfaction of eating: momentarily postponing gratification. This self-imposed delay demonstrates the presence of mental structure.

Operant. Kent is engaging in a complex performance in which there is point-to-point correspondence between Kent's movements of his body and the rhythmical features of JS's song. The reinforcer maintaining Kent's rhythmical movements comes from the correspondence between Kent's and JS's behavior. This is in contrast with the relatively primitive direct simple effects on the environment which reinforced reaching for cookies and dangling keys.

Observation. As Kent turned away from the observer and approached the table, JS held up a piece of cooky. Kent remained in the vicinity of the table, looking at JS. At this time, she began singing a gay little ditty and tapped her hands on the table, and Kent began moving, obviously in rhythm to her songs.

4/23/67 - 6

Clinical. The ball throwing is an example of the interpersonal use of an object, a new pattern for Kent. Kent's acceptance when JS forms his hands into a cup shows him conforming to the actions by another human being. Kent's tolerance and positive reaction to physical contact continues to develop and the therapist is facilitating the possibility of identification.

Operant. Kent is engaged in a chain of performances in which the details of JS's performances are vital discriminative stimuli. The reinforcer for throwing the ball is seeing JS catch it and receiving it in return. The fragility of these performances is indicated by the many ways JS adjusts carefully to Kent's current behavior. For example, she waited until he was looking at her before she threw the ball. It is possible that the physical contact with her was an effective reinforcer for throwing the ball since physical contact now supports so much behavior in Kent when it occurs.

Observation. Kent sat on the floor next to JS as they threw the ball back and forth. Kent threw the ball over about 4 feet right to JS's hands. She threw the ball back to Kent by forming his hands into a cup and getting very close to him, then waiting until Kent was looking. At that point, she dropped the ball into his hands.

5/9/67 - 17

Clinical. The significance of this sequence of activities was th length of time in which Kent maintained physical closeness to a familiar person. He also used the objects with some regard for their function and reacted to a variety of things. Kent was also able to tolerate the changes structured by JS with little disruption.

Operant. JS is an occasion which controls more of Kent's behavior than heretofore. Behaviors are now maintained by stimuli other than food. Objects evidencing a variety of properties are controlling Kent's behavior appropriately; the duck puzzle involves the visual properties of shape, color and depth, while objects such as the paper and pencil demand visual-tactile coordination.

Observation. Kent is engaged in several activities which involve close physical proximity to JS for a period longer than heretofore; a duck puzzle, paper and pencil, Montessori cylinders, puzzle, rings on a pole, and play dough. (The time duration was about 6 minutes before Kent walked away.)

6/8/67 - 33

Clinical. The play activity is a further shift away from primary process, with a greater degree of structure and object relatedness. His laughter was appropriate in an interpersonal relationship rather than a narcissistic discharge of tension controlled by inner stimuli.

Operant. Kent's laughter, controlled by the listener's behavior, indicates that it is now partly an operant performance reinforced by its reaction. Many new behaviors are reinforced by their effects of other people.

Observation. Kent was running around playing with one of the staff members and also interacting with other people. He came to the observer laughing and then walked away again.

6/20/67 - 33

Clinical. Kent is no longer completely placid when assaulted. Although he doesn't direct his hostility toward the other child he moves away instead of passively huddling in a ball on the floor.

Operant. Moving away is negatively reinforced by escaping the child who pushed him. Eventually such aversive stimuli will reinforce a counter-attack which will reduce the frequency of the aversive stimuli for a longer time.

Observation. One of the other children pushed Kent headlong in among some large wooden blocks with which they were playing. He got up quietly without saying anything and moved away.

6/29/67 - 37

Clinical. Kent's avoidance actions are indications of an increasing awareness of reality. He is able to anticipate probable events and actively avoid their occurrence. This indicates some concern with causal connections and is a shift to secondary process thought.

Operant. Avoidance rather than escape behavior is occurring here. Rather than terminating the aggressive behavior of the child after it occurs, Kent emits a performance, hiding, which prevents its occurrence.

Observation. Throughout most of the group observation Kent was wandering around occasionally smiling. He avoided Mark, a child who tried to annoy him on several occasions, he came once and his behind the observer to keep away from Mark's unwanted attention.

6/29/67 - 38

Clinical. Kent distinguishes external from internal stimuli which makes possible the operation of the reality principle--the regulation and control of behavior according to the requirements of the outside world.

Operant. A social chain of performances maintained because it influences another person. The sight of the observer reinforced Kent's looking. The looking was rienforced by the observer's return gaze which was the occasion (the listener's attention) on which the vocal performance "lo" was reinforced by the observer's reply.

Observation. The first time Kent walked past the observer, he stared up at him, smiled broadly and continued of his way and said, "lo."

6/29/67 - 40

Clinical. Kent is able to regulate his behavior to JS's speech. Secondary process is indicated in his appropriate responses. He shows passive-receptive mastery in attempting to induce the adults to deliver the desired tokens of attention and physical interaction. Interpersonal control has increased significantly from 4/23/67.

Operant. The attention and physical interaction reinforces complex behavior including Kent's listening to JS's speech. Kent's performances reinforced by their social effect on JS and JLC persist even after they are no longer disposed to continue the interaction.

Observation. As Kent walked past the observer and JS, she took hold of Kent and said, "Put your hands up, Kent," which he did. She then said, "Give me your foot," which he also did...JLC held the other foot and they swung Kent. At the end of the swinging, Kent looked up at JLC and said, "Hello." JS and the observer then indicated that they were pleased, they patted Kent. Kent then grabbed their hands and started to swing them. They did not reply in kind, however, and he wandered away.

7/27/67 - 44

Clinical. Kent maintains his reactivity to another person for a sustained length of time, using one mode to imitate another mode.

Operant. There is a point-to-point correspondence between Kent and JS's behavior. The performance has a high frequency, lasting throughout the song.

Observation. Kent was lying on his face in the open cupboard under the window with Miss S sitting beside him singing, "Twinkle, Twinkle, Little Star." He lay quietly not moving with his face turned towards the window. However, occasionally there was almost imperceptible movement of his left arm beating time to the song.

8/31/67 - 51-2

Clinical. Kent's resistance, negativism and his manipulation of the environment gave evidence of the emergence of volitional independence. Rather than withdrawing from a setting involving demands, Kent manipulated the situation to create the terms of his response.

Operant. The demands made by JS during this session appear to be aversive stimuli to Kent. He reacts to her physical prompts of holding his wrist and applying directional pressure in the use of the crayon with active avoidance behavior. His inclination to relax the muscle tone in his hand which releases the crayon and his returning the crayon to the box when JS had placed it in his hand are behaviors which escape JS's control. The demands made by JS, rather than other aspects of his contact with her, appear to be the aversive stimulus. Kent does not escape as in other previous aversive situations, by physical withdrawal or total passivity.

Observation. While Kent was still holding a crayon, JS guided his hand to the paper and very delicately holding him by the wrist as he was gripping the crayon, she guided his hand round in a circle on the paper. He released the crayon and then picked it up again and tapped the paper. Once again JS gently held Kent's wrist supporting it with her index finger and went round and round on the paper. Kent seemed to be gripping the crayon independently and the pressure from his finger merely guided it in a circular motion. JS selected another crayon and Kent picked it up but then released it and reached for another crayon. JS commented, "All right, you'd like a blue crayon," and he dropped the second crayon and reached for the other one which placed two on the paper. JS commented, "Well, you can use two, Kent." Putting both in his hand she again applied a small amount of pressure gently to his wrist to begin the circular motion. He resisted the motion and pushed his hand off to the side making straight lines and then dropped the crayon. JS put another crayon in his hand and he reached over and put it in the box. At this point, JS placed the lid to the crayon box beside it saying, "OK let's put the lid on, Kent. Kent immediately sank to the floor, and moved his body away from her. She reached for him and pulled him back and he was limp. He had not looked at her during this time. JS put her arm around him, held a ball in front of him, partially placed the cover on the box and said, "Let's put the cover on, then we'll play ball." Kent again sank to the floor smiling.

8/31/67 - 55-6

Clinical. These behaviors are further evidence of negativism. Kent's biting JS in response to her demands evidences Kent's ambivalence in oral sadistic form. He is increasingly aware that demands are being placed upon him and attempts to deal with them aggressively.

Operant. Despite Kent's ability to conform to simple verbal requests, he fails to comply and engages in performances which are incompatible with the control that JS indicates--throwing the whistle on the floor. The reinforcement for these performances is the preemption of JS's control through the whistle. Yet other aspects of JS's personal reactivity still sustains his attendance in her vicinity. Note that he could have preempted her control by walking away as he does from physical assault.

Observation. JS picked up a whistle and blew on it several times, then handed the whistle to Kent. He dropped it on the floor after handling it briefly. She repeated blowing on it and handed it to him, he accepted it once again, then dropped it on the floor. JS then said, "Kent, say 'no' if you don't want it." Kent put his head on her arm and she said, "No, no biting! Kent again moved from her and picked up the whistle. He sat with his back toward JS and shook the whistle using it as a rattle.

9/7/67 - 58

Clinical. Kent was able to affirm a possession by immediate and active vocalizing. The cause of distress is apparent. There is a continuously increasing variety of interpersonal games.

Operant. The withdrawal of positive reinforcers (interference with the game) was an aversive stimulus which reinforced "roaring." Note that they roar in a performance reinforced by its effect on another person rather than being elicited as in a reflex. It is not clear whether Kent's counter-control is reinforced by its effect on the child or by its effect on the adult who intervenes.

Observation. After Miss B and Kent had given up their game with the cups they began pushing a small wheeled vehicle between them. Mark, another child, intercepted the vehicle. Kent protested with a roar and Miss B said, "We are playing with that Mark." Mark went back to where his little wheeled toy was and brought it over to Kent. Kent quieted down and Mark joined them again, but Kent resented every time he stopped the wheeled toy as it was being pushed between the three.

Chapter 8

9/14/67 - 59

Clinical. Kent has moved from escape and avoidance behavior to aggressive expression of his hostility which is more appropriately directed than before.

Operant. Mark's assault produces a performance which immediately and effectively terminates it by in turn applying an aversive stimulus from which Mark escapes (counter-control). These aggressive activities continue, including pushing. Kent produces a change in his behavior by applying an aversive stimulus that reinforces it.

Observation. There was a great deal of noise and activity in the room. The children were shouting, laughing, and screaming. Kent was wandering around making a great deal of noise. When Mark got hold of Kent's collar Kent yelled furiously, pulled himself free, and walking to the back of the room where he strutted up and down, putting his hands to his ears and occasionally emitting a yell. Later, Les got in Kent's way. Kent pushed him aside energetically and slapped at him.

10/3/67 - 64

Clinical. Active mastery is indicated in Kent's behavior as he directs his request for help toward a familiar person.

Operant. This performance indicates a wide variety of ways that Kent can now tape the conduct of the adults around him and conversely, the wide range of performances he is now inclined to engage in. Many of these require the actins of another person.

Observation. Kent took off his sweater. Holding the sweater in his hands, he extended his arms toward Mrs. J who took the sweater from Kent.

10/9/67 - 65

Clinical. Kent is amenable to suggestions to play but he involves himself on his own terms. Kent's imitation of Miss S's use of the sticks indicates further progress toward secondary process. Here is subsequent secondary identification. He uses objects, the sticks, in relation to function, not just sensory exploration.

Operant. There is evidence here of Miss S's attention being an effective generalized reinforcer, probably because of the wide range of Kent's behavior that Miss S now supports. Kent's ability to imitate Miss S's use of the rhythm sticks so quickly indicates a well-developed imitation ability, a high disposition to observe her carefully and a large measure of reinforcement by producing a performance like Miss S's.

Observation. A marching record was playing and some of the children were using instruments while in a circle. Miss S was in the group of children tapping two sticks in rhythm to the music. As Kent passed near her, she leaned toward him. Kent hesitated a moment and then stopped beside her. Miss S had extended her hands, holding sticks toward him and Kent reached with both hands for the sticks. Miss S continued to hold them, and Kent stuck out his index finger and slowly put it between the sticks. He then reached for both of them, holding one in each hand, he tapped him gently together a few times in rhythm to the record and smiled. Kent then took a few steps to the cupboard nearby, lay one stick down and tapped it with the other stick.

11/1/67 - 70

Clinical. Evidence of the active mastery stage is apparent as Kent takes positive action, pulling a familiar person, to maneuver for the gratification of a need. This contrasts to earlier patterns of behavior such as crying which were simple discharge reactions.

Operant. There is a chain of performances involving the behavior of another person as one component. Pulling at Mrs. O got her attention when Kent's continued activity got her to inquire about the toilet. One more of the many ways that people now are links by which Kent acts on the physical and social environment.

Observation. Mrs. O was standing near the door. Kent, using both of his hands, pulled her toward the door. She looked at him and asked if he wanted to go to the bathroom.

11/15/67 -70 .

Clinical. Kent reacted positively to the comforting attentions of a peer; Kent's early behavior at Linwood was an impressive contrast when his peers could actually step on him, eliciting no reaction.

Operant. Tina's performance implies that there is a reinforcer maintaining this behavior. Kent's reaction reinforces Tina's behavior. His continued action suggests that it comes from previous reinforcement of similar behavior from Tina.

Observation. Kent began to gallop around screaming and crying and sat down on the bench in front of the lockers. As he had been crying, Tina watched him with what appeared a rather distressed look on her face. She sat down beside him and put her arm around his shoulders asking, "What's the matter, Kent?" He smiled and Tina then smiled and walked away. In just a few seconds he once again jumped up and down and began screaming two or three times... Kent sat down on the bench and pulled a jacket in front of his face. After a few moments he dropped the jacket and sat quite still gazing around the room.

Chapter 8

11/20/67 - 72-3

Clinical. Kent appears to derive pleasure from the manipulations and control of human beings. Evidence of this satisfaction may be indicated in Kent's 'checking' his behavior at the approach of Mrs. J and smile following his aggressive milk-throwing behavior. This sign of ambivalence in his relationships expresses the direction of more awareness of others and reality.

Operant. The behavior of reaching for the milk was reinforced by two consequences at once: the milk and the conduct of Mrs. J. This incident suggests that Kent has influenced people socially by his eating. This reactivity of Mrs. J to Kent's adtivity with food reinforces complex behavior. The reinforcer appears to be an aversive effect on Mrs. J and there is a careful adjustment of the repertoire differentially reinforced by that outcome.

Observation. Kent is alone at a table in the dining room. Mrs. J and an observer are also in the room. There is a glass of chocolate milk on another table and no one speaks. Kent walked to the cup. As he reached for the cup, Mrs. J moved toward him a bit and he immediately pulled back with a smile. When she sat down he went to the cup, picking it up with both hands and took two or three swallows. Kent then held the cup in his right hand and pulled his arm way back behind his shoulder and threw the milk at Mrs. J, splattering her and the wall. Kent smiled, very quickly moved his arm back again as if to throw the cup. Mrs. J. rapidly moved toward him and took the cup from his saying, "I was pretty sure you were going to do that." Kent smiled.

11/28/67 - 81

Clinical. Several significant shifts are apparent in Kent's rather complex involvement with JS and the ribbon. He engages in the activity on terms initiated by JS; gripping the ribbon, revolving his body and repeating the actions once he had terminated them. This would again be indicative of secondary process in Kent's ability to anticipate JS's approval and control his behavior accordingly. Little ambivalence remains about Kent's involvement with JS.

Operant. JS's attention and approval are durable generalized reinforcers.

Observation. Kent came galloping by JS holding a long piece of paper ribbon. JS took hold of one end of the ribbon and began to move it back and forth so the ribbon turned like a jump rope. As the ribbon turned around, she sang, "Round and Around we Go." Kent smiled. As he continued to hold one end of the ribbon, he began to spin his body around, smiling and squealing as he did so. After three or four revolutions, he dropped the ribbon and walked away. JS followed him, placed the ribbon again in his hand, lightly holding his fingers and tucking them around the ribbon, saying, "Hold on once more, Kent." He immediately gripped the ribbon and she removed her hand. He then started turning his body in a rotation and he continued doing it three or four times. JS said, "OK, that's very good, Kent," and he dropped the ribbon and walked away.

2/68 - 88

Clinical. Kent approaches and directs his requests for attention or help toward a particular person. The theme is no longer "relieve me," but "you pay attention to me." This level involves gratification via directing attention to the self rather than merely being relieved.

Operant. Here is a further expansion of the repertoire which is reinforced by the attention of an adult who in turn acts in some way to provide a reinforcer.

Observation. "Kent does a lot with the small puzzles with just four pieces. He tries to be contrary pretending that something is wrong with the puzzle and then he comes over and takes Miss S by the hand, and brings her over to match the puzzle. He comes frequently asking me to do things. He takes my hand to the cabinet if he wants something."

3/14/68 - 95

Clinical. Qualities of mutuality in a relationship are merging. Reciprocity was evidenced in the imitative vocal exchange and the active visual and manual exploration of Miss S by Kent. For the most part, Kent established the terms, but he contributed to the maintaining of the play. Kent was not dependent upon the actions initiated by Miss S, but introduced a change by his vocalizing. The close contact also involved a larger amount of time than heretofore.

Operant. The details of Miss S controlled and reinforced Kent's gaze. Kent's vocal performances were prompted by Miss S's and reinforced by the correspondence in rhythm and melody. Kent emits performances reinforced by physical contact "like cuddling." All of Kent's behavior is either sustained by Miss S or reinforced by her, and they have a high frequency throughout the 8-minute period.

Observation. Miss S was on the floor very close and looking directly at Kent's face and singing softly. Kent was looking at Miss S, not blankly but really focused and studying her. She moved close to him swinging her body forward from the knees and after just a moment Kent pushed her away. This was repeated two or three times. Kent continued to look at Miss S. She continued to sing and Kent began to sing also. He would duplicate and repeat that song that she was singing and then began to "la, la" to a completely different song which he did quite accurately. She changed her approach to Kent a bit by moving her body toward him and then immediately moving back and repeating this three or four times. Kent began to laugh and reached toward her with both of his arms which, when Miss S was close to him, he put around her neck and seemed to pull her body toward his. He placed his face close to hers continuing to smile and put his head against Miss S's cheek and his mouth against her face a bit opened as if to imitate a kiss. Kent then pulled his head back a bit and placed both of his hands on her cheeks and patted them very tently. While he was doing this his eyes were directly on her eyes and he was smiling. Kent again pulled Miss S toward him and cuddled his face against hers for a few moments. (The whole episode was about eight minutes.)

3/15/68 - 98

Clinical. JS involved Kent by using the vigorous physical contact to which he had previously responded. He was able to participate briefly in an activity structured on group terms. This example is another indication of Kent's increasing awareness of approval and his responsiveness to requests from a familiar person as well as his ability to relate to group activity.

Operant. The initial performances appear to be mostly under JS's personal control, generalized reinforcement by her involvement. Kent's return to the activity shows the function of the group activity as one of the reinforcers maintaining the performance in addition to JS's involvement.

Observation. JS and three or four of the staff members were working with several children in the hallway during the lunch hour at a group game. Two played "Here we go Around the Mulberry Bush" done with circling and singing. JS reached out and pulled Kent into the circle while they were in motion. He made two or three rounds with the group then pulled out of it. He watched a few moments and then voluntarily came close to the circle and reached out to JS as if to rejoin the activity. She again pulled him into the circle and he moved with the rest of the children.

3/21/68 - 100

Clinical. Kent's hostility and aggression were adequately expressed.

Operant. Karen's close contact and handling of his body was an aversive stimulus whose termination reinforced pushing Karen away. This class of behaviors continued in frequency even after he drove Karen off.

Observation. Karen, one of the children, moved close to Kent, putting her nose practically against his, smiling and then pulled on his arm. Kent quite quickly pushed her away with a vigorous shove, and then he walked over to Glenn and gave him a hard push.

3/29/68 - 102

Clinical. Kent observes and imitates a sequence of actions appropriately. He now derives pleasure and satisfaction from approaching and reciprocating the activities involving others rather than solely reacting to inner stimuli--the emergence of secondary identification.

Operant. Activities which have structured effects on the environment now are generalized reinforcers for Kent.

Observation. Several of the children had been making paper kites with tails and a long string permitting the child to raise it in the air. Mrs. O was involved in an activity with Karen where she would lift the kite high in the air and Karen would reach for it. Kent stood near for a while, then began to engage in the kite-chasing activity. He was following along with Karen and repeating many of her actions such as reaching high in the air and reversing his body when the direction of the kite was altered. Mrs. O gave the kite to Kent and he smiled and very quickly extended his arms and moved his body as if to wave the kite in imitation of what Mrs. O had been doing. He didn't persist in this imitative motion very long and just began to carry the kite around the room for a few minutes, then walked to the block cupboard and began to play with some of the manipulative toys.

4/10/68 - 105

Clinical. Kent now initiates and sustains a more refined quality of mutuality which involves directing attention to himself.

Operant. Kent initiates behavior reinforced by a direct social effect on another person. The structured reaction itself is the reinforcer and the performance is differentially reinforced by the structured interaction with the adult. The repertoire is sufficiently varies that Kent emits a performance relevant to each component of Miss S's reactivity.

Observation. Miss S was seated on the floor near the toy cabinet. Kent had been using blocks, then began to wander around. Kent approached Miss S, then he leaned his back against hers, moving back and forth a bit. Miss S reacted with, "Hey boy, what are you doing?" in a playful tone. Kent leaned his head around and placed it in front of her face with a smile. He then walked away, but returned once again to repeat the leaning and reacting to her comments. This was repeated three or four times.

Chapter 8

4/10/68 - 106-7

Clinical. This exchange, involving a degree of mutuality, again directs attention to Kent and the self, involving language as a component of action.

Operant. This exchange is evidence of how sustained Kent's behavior is that it can be so intermittently reinforced. Note the behavior of Kent's which is designed to (reinforced by) alter the observer's mood. The tablet, originally producing intermittent reinforcement of reaching for the necklace, becomes a reinforcer when Where's Kent" follows it.

Observation. While Kent was manipulating a chain around the observer's neck (necklace), she held a tablet between their faces commenting, "Where's Kent?" He immediately pushed the tablet aside and continued to play with the necklace. By the third or fourth time this was repeated, with Kent continuing to push the tablet aside, he looked into the observer's eyes, smiled and giggled. The pushing aside also became more immediate and vigorous. This was continued about ten times.

5/18/68 - 112

Clinical. Kent's possessiveness of Miss S is apparent. Communicating his demands for Miss S's attention--by crying and touching show need relatedness.

Operant. The frequency of looking at Miss S has increased heretofore indicating that Miss S is a generalized reinforcer controlling even more behavior in Kent than heretofore.

Observation. Throughout the day, Kent frequently fastens his eyes on Miss S and his eyes follow her movements. At one point, she was engaged in a conversation with another staff member. Kent came to stand beside the two of them, touched Miss S and then began to cry.

Relatedness

We begin with a completely autistic child without evidence of secondary process and no evidence of any activity either positive or negative which has any relation to people. Using food and body contact and by arranging ways that simple performances can have simple structured effects on the environment, JS increases Kent's inclination to change the physical environment. Since she is the agent which makes possible most of these changes in the environment, JS's attention also becomes a reinforcer. As a result Kent acquires behavior designed to produce (reinforced by) JS's attention which is the necessary step toward the various ways JS can interact with him. As Kent acquires performances reinforced by JS's reaction and capable of influencing JS, the general repertoire is extended to Miss S who continues to expand the repertoire. As Kent acquires more behaviors reinforced by adults or reinforced by structured effects on the physical environment with the help of collateral support by adults, the adult himself becomes a major reinforcer leading to many behaviors such as, gazing, focusing on details of facial expression, following and touching and pulling. The frequency of behaviors reinforced by the attention of an adult or child increases from near zero to a major part of the time the child is with the adult. Hostility and aggression, similarly are areas in which Kent had no behavior. He remained inactive in the face of physical onslaught or other aversive stimuli applied by others. With continued interpersonal development Kent not only escapes aversive stimuli by escaping an abusive child, he also avoids and hides. Later Kent exerts counter-control by applying aversive stimuli to get rid of a child who is annoying. Collateral behaviors in which he begins to manipulate others (who are not annoying) for his own purpose. He produces behavior by applying an aversive stimulus which they terminate.

Profile in the Drive for Mastery:

Activities become more differentiated, complex, and integrated.

1/67 - 31

Clinical. Kent continues to fixate in a stereotyped activity using the string in a sensory manner to obtain autoerotic gratification; evidence of Kent's narcissism. He is, however, receptive to change, an indication of a decrease in compulsion.

Operant. Beginning with the performance reinforced by the direct manipulation of the string, JS expanded the repertoire by introducing strings of other colors and then typing them together. The variation in the consequences of pla-ing with strings was sufficiently close to Kent's behavior that the new reinforcer continued to support the behavior and the result was an expanded repertoire.

Observation. "He sometimes came in with a string, manipulating it on two fingers and he was pretty good at it. He was occupied with it for a long time. My approach was to offer him another string, in another color. He was kind of interested in it, exchanged it and got back to his old string. I then took four different pieces of colored shoe laces and tied the four together at both ends. I offered this to him and he really became intrigued, and I became intrigued with what he was doing with it. He put four fingers through it and manipulated the string." (JS)

4/25/67 - 8

Clinical. Kent manipulates an object in terms of function as well as visual and tactile examination. The ball, however, is still a nonspecific object and the emphasis continues to be primarily on the exploration of surface-sensory qualities.

Operant. The consequences of throwing the ball, involving JS catching and returning it and the visual and tactile stimulation from it, support the performances. JS's reactivity specifically in favor of structured use of the ball maintains the frequency of the required performances and decreases the frequency of the others.

Observation. JS rolled the ball off the table with an instruction, "Go get it, Kent." The floor of the room sloped toward her so that the ball would roll back to her. She threw it down again; instead of going after the ball, Kent began patting his hands at the same time squealing happily. Miss S began tapping the table in rhythm apparently expecting him to do the same. When he didn't, she shifted toward a patty-cake game which didn't get very far. "Let's get the ball," and she took him by the hand and led him to the ball. He still didn't pick it up, so then she rolled the ball to him. He caught the ball and rolled it back. She bounced it in front of him and he bounced it. They then began throwing it back and forth, three or four times. In the interim, JS had gotten the second ball and they were passing the two balls back and forth. Somewhere about this time, she gave him a tiny piece of cracker. When he threw one of the balls away from her--away from her direction rather than to her--she terminated this part of the interchange.

5/9/67 - 18

Clinical. The objects or cylinders are now explored and manipulated as a three-dimensional entity.

Observation. JS replaced the paper with a set of difficult Montessori cylinders and the receptacle into which they fit. Putting her hand over all of the cylinders but three, she limited the difficulty of the task. After Kent had taken the three cylinders out of the form and replaced them accurately, she removed her hand from the form allowing Kent to take all of the cylinders out and replace them. When Kent fell off his chair, she put him on her lap to complete the rest of the cylinders. The performance of inserting the cylinders into the holes required Kent's behavior to be under the control of the diameter of the cylinder, its depth and the depth of the hole.

8/31/67 - 43

Clinical. Kent's problem-solving behavior evidences a degree of mental imagery which is a prerequisite for awareness of causal connections.

Operant. The reinforcer maintaining the performance is the exact set of cylinders in the block of wood into which they were to be inserted. This outcome controls Kent's adjustment of the cylinders precisely and quickly. The reinforcer for these performances was the exact fit of one into the other. The outcome maintains all of the searching and trial and error of behavior and Kent's performances sustained until all of the cups are stacked, one inside the other. Each performance requires the different adjustment since each cup is progressively smaller than the next one.

Observation. Kent would pick up the Montessori cylinders with both hands but use his right hand to actually place the cylinder in the space. He then made an incorrect selection but quickly seemed to detect that it was not deep enough and pulled it out immediately replacing it with the one in his other hand, which was correct.

9/7/67 - 58

Clinical. This sequence reveals Kent's more intensive and varied use of objects. He is discovering the properties by a series of motor behaviors and visual examinations.

Observation. Kent and Miss B were sitting on the floor by the door and Miss B was occasionally singing to him. Kent occasionally fussed and scolded. He was surrounded by a series of plastic blocks, cups, etc. As the observer watched, he began with Miss B's assistance to put the cups together. Miss B's technique was merely to set the cups with the open end up but not in order. Kent picked out the appropriate ones, sitting one into the other exactly and rejecting the ones which were not of the immediate next smaller size. He gradually built all the cups up until he had them stacked one inside the other. His fussing came when he thought Miss B was trying to take over the work from him and I noticed that she was sensitively aware of this and immediately stopped when he scolded.

10/2/67 - 63

Clinical. In his use of the blocks, Kent is combining objects and mastering them as a functional unit. The surface-sensory examination continues in conjunction with the more complex manipulation.

Operant. The various structured outcomes with the shapes and colors of the blocks and their arrangement in rows and piles reinforces the performance of piling them. The reinforcers consist of the exactness of the row, the homogeneous grouping of blocks by color and the particular forms produced by the arrangements.

Observation. Kent sat down on the floor by the top cupboard and using his right hand pulled about a dozen plastic stacking blocks from the container on the shelf. The stacking blocks were white and red and he pulled both colors from the container; he put all the white ones in one place and all of the red ones in another place. Then, using both hands he put the red ones on top of the white blocks. As he stacked them, he positioned the blocks in a long line; the blocks were rectangular and these were lined up with sides matching. When the blocks were stacked and lined in front of him, Kent using his right hand rubbed back and forth several times across the top of the blocks which had rough indentations for stacking the blocks...Kent again looked at the blocks and using his left hand he gently pushed against the sides of the blocks nearest him, apparently to straighten them. He had twelve or fourteen of these stacked blocks in a row.

11/20/67 - 73

Clinical. This sequence of Kent and JS indicates integration of activities involving equipment and a familiar person; the bi-personal use of objects. There is increasing complexity as Kent responds appropriately to verbal requests, imitates JS's behavior and uses the blocks in a more sophisticated manner, narrowing the functions to the most appropriate ones--stacking and aligning the blocks. Kent's search for the fallen blocks, out of visual range, implies awareness of permanence. The presence of such mental imagery makes possible visualizing prospective events which can then by symbolically manipulated.

Observation. JS placed a box of small building blocks about 2" in diameter on the table in front of Kent, saying "You take one and I'll take one and we'll put them together." He put the sides of three or four blocks together so that they formed a line directly in front of him parallel to the edge of the table. JS then suggested, "You put one on the top." She stacked the blocks in front of her which were about four to a tower. She was working fairly close to Kent so that he could easily see what she was doing and how she was manipulating the blocks. Using his right hand, he took her stack of blocks down and put them in a line. JS then put two parallel lines of blocks in front of Kent and handed him another block. Kent then pulled the blocks from the line farthest away from him and combined them with the blocks already in front of him to make one long line. JS constructed another line of blocks extending it at a 45° angle behind Kent's line of blocks. Kent immediately added these to his line of blocks which made it number about fourteen. JS then moved the blocks into three separate lines, all parallel, and placed more blocks in a random position on the table close to the three parallel lines. Kent immediately pulled the blocks from the line farthest from him and stacked them on top of the blocks in the front line, so that he had a tower of two blocks. He then stacked two of these towers together so that he made two stacks of four blocks each. JS immediately said that it was very good. Some of the blocks went tumbling to the floor; Kent pulled a chair back from the table and started looking on the floor. The frequency with which Kent took JS's blocks to continue the expansion of his "line of blocks" indicates how durable the performance reinforced by producing a straight line is. The performance of taking blocks to add to his own line expands the procedure into producing even longer lines of blocks and under a variety of circumstances, and eventually Kent moves into a more complex structure involving putting one block on top of the other. JS's immediate vocal reply to his stacking the blocks shows a constant differential reactivity to outcomes of greater structuring the physical environment.

11/28/67 - 78

Clinical. After Kent's attention has been concentrated on building, he is able to manage the discharge of tension by active galloping. This intense but brief physical expression enables him to return his attention to the blocks. This might be compared to earlier incidents, where Kent would begin crying after a period of concentration. In his use of objects, in this case the blocks, the increasing complexity of structure reveals greater perceptual organization.

Operant. The reinforcer maintaining these performances appears to be the color arrangement and the regular pattern produced by the physical shape and color configurations. Kent's ability to assemble the blocks from the various body positions and with one hand suggests that these outcomes can sustain a broad class of behaviors which produce them.

Observation. Sitting at the observer's seat, Kent made a long line of blocks, two high with a white one consistently on the bottom and a red one on the top. He glanced smilingly at the observer briefly, then galloped around the room in a circle and returned to the blocks. This time after separating them, he re-positioned them with a white block on top instead of the red one. Following this, he re-stacked all the blocks into a tower alternating a red and white similar to the one he had built before. He patted the top of the tower with his hand in obvious satisfaction, and then once again began separating them two at a time into separate piles. Once again, reversing the colors from the previous long row of blocks. He then shifted to a prone position on the floor and stacked all of the blocks once again into a tower using only his right hand.

11/28/67 - 79

Clinical. The length of Kent's attentive span is evidence of a decrease in emotional preoccupation with internal stimuli. This permits Kent more opportunity for active observation of his surroundings. In the event of his apparent frustration--not receiving immediate satisfaction in the block arrangement, Kent functioned constructively by persisting in manipulating the blocks appropriately. The blocks in this instance are used in a more sophisticated manner since their functions have been narrowed to the most appropriate ones. The separate pieces are combined and mastered as a structural unit.

Operant. The compulsive alternation of red and white blocks reinforced all of the behaviors necessary to produce the maintenance of the standard pattern.

Observation. Teh observer had built two small towers of interlocking blocks with a red colored block at the bottom of each. Kent picked up the one tower and placed it on the top of the other but noticed that there were two red blocks in a row where he had joined the two stacks together. This was in contrast to his usual pattern of alternate red and white blocks. He separated the two stacks again, turned them around and as he looked at it intently, he noticed that there were still two consecutive red blocks. He then took the bottom red block off which made possible the alternate red and white pattern of his previous structures. He patted the tower and smiled.

11/28/67 - 80

Clinical. Kent's ability to complete the puzzle implies an awareness of causality and the existence of some mental image. An extended attentive state is also demanded. The complex interaction between Kent and Miss S, expresses increasing mutuality. Kent's mastery in the manipulation of objects evidently produces inner satisfaction as his attention is sustained. This implies Kent's awareness and subsequent responses in terms of their effect on Miss S. Many examples of communication are also evident in terms of gestures and words which signal specific events, such as Miss S's comment, ". . .put them back," and Kent's immediate compliance.

Operant. This Montessori form with variations in both size, shape and color requires Kent's performance to be under the control of many physical properties of these objects simultaneously. His ability to insert most of the objects without trial and error indicates that he already has performances controlled by all of these dimensions of the objects. The complexity of the puzzle, however, requires collateral support from Miss S and the low frequency of behavior is seen by the prepotency of the performances prompted by Miss S's singing.

Observation. Miss S put a Montessori form board in front of Kent commenting, "Here Kent, sit down," as she put him in his seat with a slight pressure on his shoulders. Kent immediately took the sets of geometric shapes, circles, triangles, and squares out of the form board; each set was a different color and contained four size variations of each shape. After Kent removed all of the pieces, Miss S commented, "Kent, let's put them back," and he immediately began to replace the pieces. He was able to replace the circles without any experimentation. The triangles were put into place after first attempting to put them in the square forms. He then tried to put a large triangle into a smaller form and eventually got it in the right place by sliding it along until it fell into the correct form. When Kent stood up to go, Miss S, with her hand on his shoulder said, "Let's put these back and then you can go, Kent," pointing to the squares. Kent picked up one of the squares and Miss S sang as he began to replace it. Kent looked at her, smiled and slid from the chair to the floor. Miss S picked him up saying, "Let's finish it," and with her body essentially enveloping his in the chair so that he was more or less contained by her, he immediately put back all of the four squares into their proper holes quickly and accurately. As soon as he succeeded in replacing the forms, Miss S said, "OK, very good you can leave now, Kent," and as soon as she stepped back from his chair, he smiled and galloped away.

2/26/68 - 89

Clinical. This behavior presents spontaneous reproduction of a rather complex sequence of goal-directed actions. The imitation of the particular sequence indicates that Kent is aware of actions beyond his immediate perceptual environment.

Operant. This performance indicates that Kent has had so many successful experiences of acting on his physical environment that observation of other people's activities are conditioned reinforcers which prompt similar behaviors in his own repertoire.

Observation. "I had the three girls and we were taking turns playing by dropping clothes pins in a bucket. I just left the clothes pins and the bucket on the table and I turned around and Kent was over there doing the same thing. I went over and played with him as he was dropping them in." (Miss S)

3/21/68 - 101

Clinical. Kent's awareness of causality is indicated in this case with an increasing degree of complexity. The activity sequence appropriately incorporating differentiated objects again implies the existence of a mental image.

Operant. The performances reinforced by the disassembly of the plastic nuts and bolts are clearly prepotent over the interpersonal control by the observer, Miss S or JS. Despite Kent's pushing them out of the way, however, his inclination to disassemble the pieces is sufficiently high that the demonstration by the screwdriver leads him to try it.

The frequency and persistence of the behavior indicates a very durable repertoire considerably more persistent than many of the examples so far and approaching that of many normal children.

Observation. The toys were composed of four different types of pieces. One was a plastic strip which had holes in it and another was nuts. There were also some bolts and small blocks. All of the components could be screwed together. There was also a small plastic screwdriver for tightening bolts. Some child or adult had already assembled several pieces which were strewn around the table. Kent sat down without anyone else there. He first stacked four or five blocks into a tower. He then dismantled some of the already assembled pieces, holding the plastic strip in his left hand and used a very effective and rapid screwing motion. After taking three or four apart he had trouble with one which had been rather tightly assembled. He persisted, without success for a minute or two. Then the observer tried to help him hold the bolt, and he quickly pushed her hand away. He did the same with Miss S. JS came in about this time and also offered help. Then he pushed her hand away and she said, "Don't be such a stubborn boy," and picked up the plastic screwdriver. Reaching around his body with her arm she placed a screwdriver in his hand and began to turn his hand to loosen the bolt. This maneuver disassembled the piece. She then moved back and Kent picked up a second piece that needed to be unscrewed and immediately reached for the screwdriver, put it in the proper position and began to unscrew it. He was not able to apply enough pressure to get the nut off, however.

3/29/68 - 102

Clinical. Secondary identification is indicated by Kent's independently sustaining his kite-chasing activities. Even though the period of time is brief, he continues to imitate the behavior of Karen and Mrs. O without their presence.

Operant. This is another example similar to generalized matching-to-sample in which Kent can generate a performance similar to one that he has observed, or 'compose' a performance to produce a kind of change in the physical environment he has observed.

Observation. Kent stood and watched a kite-chasing activity. He then followed along with Karen and repeated many of her actions such as reaching high in the air and reversing the body when the kite's direction changed. When Mrs. O gave the kite to Kent, he smiled, very quickly extended his arm and moved his body as if to wave the kite in imitation of what Mrs. O had been doing. He soon stopped, however, and played with some of the manipulative toys from the cupboard.

Chapter 8

2/29/68 - 103

Clinical. A sense of active mastery is manifest in contrast to Kent's earlier patterns of passive sensory gratification as he selects and accurately identifies objects.

Operant. The reinforcer here appears to be simply collecting a group of like objects. The boys themselves did not appear to sustain much behavior since he walked away quickly.

Observation. Kent, squatted on the floor in front of the block cupboard, partially pulled out a box which was full of miscellaneous toys: cars, wheel cogs, pine cones, blocks, various and sundry objects. Kent was burrowing through these using his hands alternately and pulled out about eight to ten matching toys which were small, blue plastic soldiers obviously belonging to a set. Kent piled them all on the floor together and spent about five minutes moving them around. Then he walked away to another activity.

4/10/68 - 104

Clinical. Even though Kent has been using the blocks in a functionally appropriate manner, this new pattern has more sequential quality.

Operant. As in the preceding example the reinforcer for the performance appears to be the control of Kent's behavior by the various features of physical objects he is classifying. In this case, the performance is controlled in quite a complex way since the performance was controlled simultaneously by four or five dimensions of the stimulus.

Observation. Kent had arranged a set of building blocks in a new pattern. They were arranged in four rows, very evenly with sides touching. All the sides with letters were placed up and each row consisted of one color--a blue, a red, a green, and a yellow.

4/10/68 - 104

Clinical. Kent is manipulating the environment not only with increasing activity but also more effectiveness. This sequence involves some mental imagery and a goal or plan. Significantly, Kent alters his actions when confronted with barriers, and the changes produce more effective changes in the environment. The beginnings of improvisation are emerging.

Operant. This is one more incident of the large variety of ways that Kent is rearranging the physical environment in highly structured ways. The incident describes the long series of performances maintained by a single outcome. Kent had to engage in a complex sequence of activities each reinforced intermittently in order to achieve the final position of the cabinets.

Observation. Kent moved two heavy cupboards quite a distance apart out into the center of the room. He moved one by giving a series of pushes from behind. Since the pieces were very heavy, each push required considerable force with little movement. Kent then walked to the second cupboard and began to shove it toward the other. He was trying to move it at an angle in order to meet the other cupboard. In order to do this, Kent shoved from several different positions around the cupbaord. After several vigorous pushes which didn't move the cupbaord, the observer moved beside Kent and gave a push with Kent when he initiated it. When the piece moved, the observer returned to her chair and Kent continued to shove, this time with success. When it got stuck again, Kent looked toward the observer and took two or three steps in her direction, then returned to his pushing. Alternately shoving and pushing teh two cupboards, Kent persevered until they were together. He then looked where they joined and pushed them from the sides until they not only touched but were even with the edges exactly together and matched. When this was accomplished, Kent leaned against the cupboard and smiled.

Profile of Communication

4/19/67 - 8

Clinical. Kent exhibits an increase in vocalizing with a familiar activity or person. Kent's reactivity, however, is essentially an undirected expression. This vocal behavior contrasts with Kent's early patterns of indiscriminate expression of affect for the sake of lowering inner discomfort with no apparent "audience" in mind.

Operant. The procedure with the ball and spoon was designed to bring performances under the control of speech sounds. The necessity of holding onto the ball indicates that Kent is not controlled by JS's speech. The vocal performance is probably emotional rather than operant behavior.

Observation. Kent returned to the vicinity of the table where she picked him up and sat him on the chair. She then gave the instruction, "Give me the spoon," and at the same time held on to the ball so that only the spoon could be taken. When he gave her the spoon she said, "OK" and handed him a tiny bit of cracker. "Give me the ball," was followed by him handing the ball to her and again reinforced by "OK" and a small piece of cracker. Then they rolled the ball back and forth across the table with a few seconds of lively chatter from Miss S and a corresponding squeal from Kent.

Chapter 8

4/28/67 - 12

Clinical. Kent evidences a more directed expression of tension in his motor response to JS's use of rhythm. This behavior from Kent gives evidence of greater reactivity to external stimuli.

Operant. Kent's performance is closely prompted by Miss S's speech as she sings.

Observation. When Miss S sang a gay little ditty and tapped her hands on the table, Kent moved, in rhythm to her songs. First he touched his left forearm with his right palm in rhythm and then reversed hands. At other times he waved with his hands in rhythm.

5/9/67 - 20

Clinical. A particular significance of this anecdote is the expression of Kent's internal processes acting on the external environment which is a precurser of the establishment of the relationship of signals to events.

Operant. Here is evidence of Kent's echoic behavior prompted by JS's song. Kent's ability to hum the song some time after hearing it indicates considerable verbal ability as a listener who could shift from an echoic to freely emitted performance.

Observation. JS sang, "La, la in a lilting refrain as she grasped Kent's hands in the characteristic posture which has been described in previous episodes in which there is a reinforcement of jumping by JS pulling in synchronally with his pushes against the floor. In this case, however, Kent simply dragged and there was very little tendency to raise himself off the floor or jump. She then switched to holding Kent at a distance so that his weight was supported against her hands, rocked back and forth with him. Again Kent was not reactive. When Kent walked away, he sang "La, la" much in the manner of the ditty that JS had been singing. JS picked Kent up, held him and moved about in a playful interchange with him in her arms.

5/9/67 - 21

Clinical. Secondary identification is indicated in Kent's spontaneous vocalizing which continues with an increasing variety of sounds.

Operant. The reinforcer for the vocal performances was their direct effect rather than any communication function, much as many of the performances presented in the mastery profile. JS took advantage of a period when there was a high frequency of vocal behavior to arrange an environment in which a vocal performance could be reinforced by its effect on her. The particular form of the performance was not so important as the functional relationship to its reinforcer. Thus she gave the bit of cooky when she judged that the performance was related to past behaviors of Kent reinforced by food. The performance is a mand, as described by B. F. Skinner in Verbal Behavior.

Observation. JS tapped the top of the table and Kent sang something like the ditty which Miss S had been singing. Then JS picked Kent up again and he continued a fairly high level of vocalization. This time the songs were based around the syllables, "De-da," and JS during the course of this, took a cooky which she held in her hand. Then she danced around the room with Kent with a song something like "London Bridge," except in tune with nonsense syllables. When Kent joined in with some vocalizations which, if one were generous, could be interpreted as saying something like I want a cooky, or give me something, she very quietly and without any reply handed him the cooky.

6/22/67 - 36

Clinical. Lifting his leg is a manner of communication with the staff since the interpersonal relation is part of the motivation. Communication has been established in that a particular sound or gesture to the child is a signal for a specific action. Kent has, at this point, left the solipsistic state.

Operant. The verbal control by JS is minimal as seen by the necessity of holding Kent's hands to produce compliance with the instruction about his leg. The episode illustrates the importance of some motivated performance as the basis for verbal behavior. First there is the child's inclination to comply with requests such as moving a limb and secondarily there is differential occurrence of one movement rather than another depending on the instruction. The behavior is verbal primarily because of its interpersonal control. The reinforcer for lifting the leg is the reaction of the observer implied in the phrase, "Do it for Miss B."

Observation. JS asked several staff members to observe something new she had taught Kent. Kent immediately put his hands over his head. JS put his hands down, and said, "Lift your foot," while still holding his hands. Kent did so. JS then asked Kent to do the same for Miss S and he didn't do it. Soon thereafter Miss B came into the room and Kent raised his leg at JS's request. All three joined in the game, "One, two, three, up we go." When they returned to Miss S, Kent was now willing to do it for her and they played the game again.

5/20/67 - 40

Clinical. This exchange is indicative of greater refinement in the communication process. Kent's spontaneous and appropriate verbal behavior conveys the theme, "You pay attention to me." Secondary process.

Operant. A verbal performance reinforced by its general effect on the listener (generalized reinforcer).

Observation. As Kent wasliked past the observer and JS, she took hold of him and said, "Give your foot to JLC, which he did and they swung him, also holding his hands. At the end of the swinging he looked up at the observer who held his feet and said, "Hello."

5/27/67 - 44

Clinical. This incident is an additional example of Kent's continuing and expanding reactivity to external stimuli. He is kinesetically imitating an auditory stimulus.

Operant. Another example (see 4.28.67) of Kent under point-to-point control of Miss S's verbal stimuli.

Observation. When the observer entered, Kent was lying on his face in the open cupboard under the window, Miss S sitting beside him, sang "Twinkle, Twinkle. He lay quietly not moving with his face turned toward the window. However, occasionally there was almost imperceptible movement of his left arm beating time to the song as the staff member sang.

10/9/67 - 65

Clinical. There is a lengthening of Kent's attentive state which permits the more complex reactivity to external events. Auditory stimuli prompt both vocal and motor activity. Secondary imitation.

Operant. An example of echoic behavior with exact point-to-point correspondence between Kent's sounds and the sounds he is matching. Identity of match appears to be an effective reinforcer for behaviors that can reproduce a variety of tunes he hears.

Observation. A marching record was being played on the record player and several children were using various musical instruments... Kent climbed up on a cupboard holding two instrument sticks, and began to "La, la" in rhythm to the record. His tones went up and down the scale as the record tones went up and down.

10/24/67 - 68

Clinical. Kent's spontaneous vocalizing as an accompaniment to his activity is a sign of some degree of secondary identification. His imitative behavior is occurring without the presence of the familiar person.

Operant. The speaker's verbal performance reinforced by its effect on the listener, Kent. This behavior implies a previous listening repertoire in which some performance, echoic or non-verbal occurred under the control of all of the details of many auditory stimuli.

Observation. Kent returned to the stacking blocks and sat down on the floor; using the tune, "Skip to My Lou," for the sounds, "La, la" and "Um bah" he began to stack the blocks into a tower using all that had been in a long line on the floor.

11/28/67 - 80

Clinical. The establishment of communication is again apparent as Kent responds to particular sound or instructions and gestures as a signal for a specific action. Mutuality is also involved as outer achievement (puzzle manipulation) results in inner satisfaction (smiling) for both Kent and Miss S through combined action.

Operant. Here is evidence of control of Kent's behavior by complex features of verbal stimuli from JS. The behavior controlled from the first stimuli could have had collateral support from situational features but the second instruction, "Put these back," was carried out without any gestures.

Observation. Kent was sitting at a table beside JS. He had taken the pieces from a form board. While Kent was removing the pieces there was no comment from JS although she was watching him intently. After he had removed them all JS commented, "Kent, let's put them back," and Kent immediately began to replace the pieces. He replaced the circles first and put each shape in the correct form with no experimenting necessary. He then began to replace the triangles; first attempting to put them in the square forms and then trying to put the largest triangle in the smaller form...after he had replaced all of the triangle shapes, Kent stood up and JS immediately touched his shoulder and said, "Let's put this back and then you can go, Kent." Kent picked up one of the squares and as he began to replace it, JS sang, "La, la" very softly. He looked at her and smiled.

12/9/67 - 83

Clinical. Indications of differentiation are evident as Kent is apparently able to make connections between his inner pressures and signals given by Miss S. This is a sign of greater organization and more interest in that part of reality which meets Kent's more specific needs and provides comforts.

Operant. There is no evidence of just how much of the complex instruction is critical for the subsequent behavior it controlled in

Kent. The verbal statement along with collateral features of the situation prompted performances leading to food from Miss S.

Observation. Kent finished a bowl of fruit and still holding the bowl in his right hand, used his left hand to pull on the binder which kept him in his chair. It came off immediately and he stepped off the bench, walked over to the serving table and reached for the bowl containing the fruit. Miss S moved quickly beside Kent asking, "If you want more, sit down and I'll bring it to you." He complied immediately, returning to the bench, sitting down...Kent held the bowl while Miss S filled it. He ate very quickly, once again his eyes directed in the bowl.

1/5/68 - 85

Clinical. Mutuality between Kent and Miss S is apparent in Kent's affectomotor patterns as outer achievement and inner satisfaction occurs for both through combined activity.

Operant. A chain of performances in which most of the components are verbal. Kent's saying is reinforced by Miss S's singing which is the occasion on which Miss S puts her head next to Kent's, which is the occasion on which Kent touches and looks at Miss S's face.

Observation. When he had finished eating and was still sitting at the bench, he was using the sounds, "La, la" to the tune "Skip to My Lou" and smiling. He put his hands over his eyes and turned his head back and forth. Miss S. then walked very close to Kent and put her head in front of his face and smiling, said, "La, la" to the same tune. Kent's eyes were focused directly on Miss S's and he smiled, reaching toward her with both of his hands and patted her face.

3/8/68 - 94

Clinical. The beginnings of articulation are emerging. Accompanying these is Kent's evident pleasure in engaging, manipulating, and controlling people.

Operant. There is a substantial frequency of performance reinforced by a generalized effect on the listener. The articulation patterns do not get close to English but they derive their form and frequency from the reactivity of the listener so continued emission of the repertoire will lead to closer approximations to normal articulation patterns.

Observation. JS: "We cannot say this child talks, but I have heard him repeat jello when I gave him some. He can do "La, la" very well...When he sings "Mary Had a Little Lamb," he will give you "little lamb," but you have to listen very carefully because it sounds as if he has given you ten 1's. So he gives it you and looks at you and it's as if it is kind of a game...Even on the video tape you can see that he has been able to say, "Hello."

4/10/68 - 106

Clinical. The establishment of a specific signal for a particular event is observable in this sequence. Kent's direct and discriminate behavior acts on and alters the environment. He again participates in an exchange of mutuality.

Operant. This same episode, described in the relatedness profile, shows the relations between the emergence of verbal behavior and generalized reinforcement from interpersonal behavior. First there were performances reinforced by producing behavior in another person. Then speaking becomes one of the ways to influence that person because of his special reactivity to speech over other forms of conduct.

Observation. Kent was playing with the observer's necklace. She held a tablet between their faces commenting, "Where's Kent?" He immediately pushed the tablet aside and continued to play with the chain. By the third or fourth time this was repeated, with Kent continuing to push the tablet aside, Kent looked into the observer's eyes, smiled, and giggled. The pushing aside becmae more immediate and rigorous. This was continued for about ten times.

4/11/68 - 107

Clinical. Kent's cracker-crumbling behavior serves as the basis for JS developing an articulation pattern. Preceding examples of mutuality have been established, the existence of outer achievement supporting inner satisfaction. This makes possible Kent's efforts as he is able to fathom his actions influence a social being.

Operant. This is an example of a tact. The reinforcement is not primarily under the control of a level of deprivation in the speaker. JS uses the occasion to prompt "cracker" as an echoic performance. The reinforcer appears to be the effect of the sound on himself rather than some consequence applied by JS.

Observation. JS commented that Kent had said "cracker" recently during the dinner hour. He had been engaging in his frequent pattern of crunching soda crackers into fine crumbs and then sifting them through his fingers. She began to share in the activity by also crumbling crackers, accompanied by a little song in which she said, "Crackers" with deliberate emphasis. After this had been repeated several times Kent imitated her "crackers" verbally.

Chapter 8

5/9/68 - 108

Clinical. The incorporation of vocal behavior with signs and actions in an interaction with a familiar person identifies Kent as a social being. This indicates some degree of distinction between self and non-self that Kent is able to influence Miss S by his behavior. This then, reinforces or supports the advantages of mutuality, therefore the first conscious responsiveness to others. This is an indication of a decrease in narcissism.

Operant. Kent's vocal performances which produce (are reinforced by) JS playing with him have a high frequency and obvious durability.

Observation. Kent approached Miss S (5 minutes later than preceding anecdote), moved his body toward her smiling, and emitted considerable vocal behavior in terms of intensity and intonation. Miss S reached toward Kent and he moved toward her outstretched arms. She picked him up, jumping him, immediately following one of his vocal outbursts. He continued vocalizing while she jumped him up in the air several times and the smiling and vocalization continued. Miss S then put Kent's feet back on the floor and she initiated this rather than Kent withdrawing from the contact.

Expression of Instinctual Drives

7/20/67 - 38-9

Clinical. Kent's energy is discharged in undirected walking accompanied by oral involvement intermittently chewing his shirt.

Operant. Although many performances are being omitted, few are operant behaviors reinforced by the specific effect on the environment that follows them.

Observation. Kent was walking around and around the room. He did this throughout the whole period of observation until JS finally came in approximately two minutes before the observation period ended. Occasionally as Kent walked, he pulled up his shirt and put it in his mouth.

7/27/67 - 43

Clinical. The random pattern of releasing tension is again evidenced in Kent's wandering. This time the occasional production of sounds is quite different from Kent's extreme passivity when he was just admitted. The lack of differentiation between animate and inarticulate objects remains however.

Operant. A greater range of performances is being emitted including vocal ones. Although there is no specific effect on the environment which maintains any of these in the sense of a reinforcer.

Observation. Kent was walking around the room. The observer noticed that he stuck out his hands rather indiscriminately in various objects as he went on. During one occasion, slapping vaguely at Tina on the back as he went past her. He also was rather noisy letting out shouts and smiling.

10/2/67 - 63

Clinical. Note the sensory exploration; autoerotic gratification exemplifies Kent's use of objects as a release of energy. He does, however, use objects with simple functions which indicates the possibility of some awareness of himself as different from his environment.

Operant. Some of these performances are maintained by the immediate sensory effects they produce. The performance of stacking the blocks in a row appears to be part of a chain which makes possible the next behavior of rubbing his hand over the row. The arrangement of the blocks into a row is a performance in which the manipulation of the environment is slightly removed from the immediate sensory effect it produces.

Observation. Kent walked to the toy cupboard and sat down on the floor in a squatting position with his legs folded under him and up inside. He retained this position for just a few seconds and then lay on his stomach on the floor. With his right hand he rubbed two pieces of plastic cylinders together, but did not focus his eyes on the cylinders...He then stood up and walked to a rug which was on the floor, and lay on it on his stomach. He immediately turned over and put his feet straight up in the air resting them against a cabinet... He stacked and lined blocks in front of him and rubbed his hands back and forth over the rough indentations of the blocks.

10/16/67 - 67

Clinical. Kent's exploring and probing is a further development of the previous example and perhaps an indication of a modification of behavior. Energy is more actively directed.

Operant. This episode shows an increase in the variety and persistence of the random behaviors being emitted. The clinical interpretation implies that some of the change in the form of these behaviors is a result of more structured performances produced by direct reinforcement in other areas.

Observation. Kent walked to a corner where the wall and the storage cabinet met. There was a space behind the cabinet and Kent put his hand and arm behind the cabinet as far as he could reach and from the movement of his shoulder it appeared that he was moving his arm up and down. He then attempted to put his head behind the cupbaord but it was not large enough so he stood for several moments with his head tightly pressed against the cupboard. Kent then jumped back with a smile on his face and ran to the door. He hit the door at a full run holding both hands up in front of his body to catch the impact. He turned around, still smiling. He then walked to a table and ran his hand several times across the puzzle and began to squeal. Kent then walked to the block cupboard and lay on the top of it with his left foor hanging down and moving his foot back and forth with his face toward the window.

10/16/67 - 67

Clinical. Kent's use of objects continues in the form of exploratory poking and probing in addition to textual sensation. This again indicates a shift from primitive narcissism.

Operant. Although it is difficult to identify reinforcers for many of the performances Kent engages in, there are increasing instances of behaviors maintained by a specific, although simple, effect on the environment.

Observation. During this time, Miss S and several of the children were singing and began to dance around the room. As the children moved close to Kent, he glanced up as they moved past him. His eyes again turned back to the inverted cups and he set one inside another. He then changed his position so that both legs were sticking out in front of his body and he put his thumb in one of the cups and moved it back and forth in a stirring motion.

11/15/67 - 70

Clinical. Kent was able to discharge tension resulting from his object relationship spontaneously without adult support. The erotic gratification from feeling textures is again present with evident release and relaxation. The humming of a tune much used by the staff is further evidence of the shift out of narcissism.

Operant. The vocal performance is a structured one arising from performances controlled, in the past, when other people were singing. The various performances described in this incident are an emotional by-product of the behavior with the blocks. The reinforcement occurring from the stacking of the blocks in a way to produce the orderly pattern alters the frequency of a wide range of behaviors described subsequently. These behaviors appear to be a direct by-product of the large magnitude of reinforcement by the blocks. Tactile manipulation of the various objects appears to be a direct and effective reinforcer, sustaining and temporarily satiating these performances.

Observation. There was a tower of about fourteen stacking blocks in front of Kent which he had evidently piled. They were stacked with alternately white and red blocks. He was sitting with little motion and suddenly jumped up and gave a high cry. He ran over to the coat lockers and lay down on the bench momentarily, then sat up and pulled three or four coats from the hooks onto the floor. There happened also to be two pair of boots in the lockers, one pair red and the other white. He turned these over on their sides with the soles of the boots toward his body and stacked them alternately red and white. Sitting once again in his spraddle-leg position, he rubbed the soles for several minutes mostly using his index finger and tipping his head to the side as he rubbed his hand back and forth. He was smiling and humming "Skip to My Lou."

11/15/67 - 70

Clinical. The bathroom episode was followed by an intense release of energy. Kent's evident resistence to the adult suggestion for toileting and the return to the room seemed to produce an explosive discharge which was expressed immediately. This contrast to the earlier diffuse rage or absolute inertness - however, it is not yet object-directed. The emotional by-products of the therapist's interaction with Kent in the toilet are seen in the various subsequent behaviors which have a very different frequency than usually.

Observation. At this point, Mrs. O was standing near the door and Kent using both of his hands pulled her hand toward the door. She looked at him and asked if he wanted to go to the bathroom, saying, "OK Kent, just a moment." They went upstairs to the bathroom and the observer following, and when she arrived Kent was standing beside the toilet with his playsuit and his underpants dropped around his knees. He stood there for a few moments and then walked to the door with a waddling motion, a bit encumbered by his clothing, then squatted down and began rubbing the floor with his hand. Mrs. O watched him for a few moments, then said, "Come on Kent, let's try again." She picked him up and led him toward the toilet, this time standing behind him with her body touching his so that he was unable to move away. Kent then leaned his body way forward so that it stretched across the stool and he put his head on the tank for a few seconds. Mrs. O then said, "OK Kent, let's try again after a while," helped him pull his pants up, and they started down the stairs...As soon as they got to the bottom of the stairs, Kent started into the dining room. Mrs. O followed him and picked him up and carried him back into the room. Back inside the room, Kent began to gallop around screaming and crying and sat down in front of the bench in front of the lockers...Kent then pulled a jacket in front of his face. After a few seconds he dropped the jacket and sat quite still gazing around the room.

Chapter 8

11/20/67 - 71-2

Clinical. Some degree of negativism seems to manifest itself initially in the context of the toileting. The motor discharge of the anger is more complex taking the form of running, jumping, and crying rather than rolling on the floor.

Operant. The amjor shift here is in the complexity of the behavior generated by the incident in the toilet rather than a diffuse autonomic reaction specific operant behaviors are emitted, such as jumping in the air, pushing against the door or the complex activity involved in withholding his usual reaction to a plate of toast.

Observation. The children had just entered the room after the arrival of the bus. Kent was sitting on the lockers with his body tucked back inside the cubbyhold and his seat stretched out along the bench. He was chewing quite vigorously at the cord of a jacket which was not his. He pulled occasionally at the cord with his right hand while he was chewing. Every few moments he would emit a kind of cry. Kent then stood up and opened the door of the playhouse next to the locker area and pushed the door wide open and then sat back down. He then carried the jacket into the playhouse with him, continuing to chew on the cord. Tina followed him in and pulled the jacket from him. Kent immediately came out of the playhouse, giving several cries--there were no apparent tears, and walked away to the locker area where he immediately pulled another jacket which had a similar tie cord from the hook and began chewing on the cord. Mrs. J. took Kent's hand saying, "Let's go to the bathroom."... (Kent returns from the bathroom.) As he entered the room he was crying and there were tears running down his cheeks. He jumped up in the air and threw his head back as he came back down to the floor. He repeated this two or three times. Mrs. J then said, "Here it is Kent," and carried a plate containing toast to him, holding it directly in front of him. Kent neither looked at the plate nor reached for it, but stood quite motionless for several moments. At this point, Kathy started crying quite vigorously. Very quickly Kent began to cry vigorously. While he was crying, he jumped in the air again and then walked to the door and pushed his body against it hard. Mrs. J came to the door, opened it and again walked out of the room with Kent.

11/28/67 - 78

Clinical. A period of activity with objects such as a tower construction with blocks is again followed by a gross expulsion of energy. Significant is the release spontaneously expressed by Kent. The evident relaxation and his independent return to the blocks.

Operant. The highly structured and obviously reinforcing activity with the blocks leads to a high frequency of a wide variety of quite structured activities. These behaviors are frequently quite structured taking their form from other situations in which they had been explicitly reinforced. The dissipation of the emotional reaction from the block experience reduces the frequency of these behaviors so that the activity with the blocks then becomes prepotent.

Observation. Kent was placing a stacking block on the top of a tall tower of about fourteen blocks that he had evidently been building. Kent walked away from the tower after a brief glance at it and stood for a few moments beside the rocking horse looking around the room. He then ran to the door smiling and giggling. He ran into the door with some force and turned around, ran back to the horse, then repeated running to the door and back again. During this time the smile remained on his face and then he walked to the locker area, pulled a hat from one of the hooks and put it in his mouth and began chewing rather vigorously. As he chewed he evidently held it tightly in his teeth for he didn't use his hands. Kent then walked into the playhouse and walked out in just a few moments carrying a purse. He was holding it in both of his hands and swung it back and forth. He walked across the room and dropped the hat from his teeth, but continued to carry the purse. At this point, Kent walked back to the tower he had been building as the observation began, picked it up with both hands after placing the purse on the floor.

11/27/67 - 80

Clinical. The range of Kent's release of energy now includes people. More direction is observable in his energy discharge and his differentiation of his environment had markedly improved. The behaviors whose frequency increases because of the emotional by-products of the successful block building now include performances supported partly by their effect on another person.

Observation. Kent had been building a tower. He then began to gallop around the room making a "ya, ya, ya" sound as he did so. There was no recognizable tune but Kent was smiling. He ran to the observer, picked up her hand and tapped it quite vigorously several times with his fingers., continuing to smile and emit the "ya, ya, ya. He then galloped over to Mrs. O and repeated the same tapping process and also with Miss S.

5/8/68 - 109

Clinical. Kent exhibited interest in a display of his body with total nakedness. This was the first time this exposure of his body had occurred. There is a shift in the primary energy investment and it is interesting to note that the discharge of a pleasurable nature manifests itself in similar behavior as in the example in 11/20/67 when he was angry.

Observation. During the day, Kent removed all of his clothes; one time while outside in the morning and two times while inside. While his clothes were removed he urinated on the floor making three puddles in varios places, but didn't direct at any people or objects. Kent accompanied his undressing activities with smiling and occasional shrieks. When he was in the "buff," he ran around the room tapping his chest and smiling and periodically leaping in the air and emitting shrieks seemingly in great delight.

5/17/68 - 143

Clinical. Orality is evidenced in Kent's pleasure in this mouthing activity. This behavior resembles the sucking delight of a young infant. The overlap of stages, the oral and other examples indicating some defense formation characterizes the autist. One is reminded of Fenizhel's comment regarding the fundamental importance for ego development of taking into the mouth and spitting out.

Operant. The operant performance of withholding, swallowing, keeping the mouth still, and manipulating the saliva with the tongue is a new performance directly reinforced by its sensory effect. This is a repertoire which is a necessary one to preceed spitting.

Observation. During the last few days, Kent has begun a new pattern. He collects saliva in his mouth and seems to swish it back and forth inside his cheeks. He has not yet tried to spit at anyone or anything, but is involved in just moving it around inside his mouth. I wasn't certain he was actually "full" of saliva, and I gently tapped his cheeks; the collection spurted out to indicate Kent indeed had a full mouth.

CHAPTER 8

APPENDIX

The following descriptions of Kent provided the excerpts presented in Chapter 8 which exemplified his development during the period of therapy at Linwood. The numbers in the left hand margin and the dates of the observations will allow the reader to see the complete data for each of the observations in Chapter 8. The observations are included in unedited form.

(1) 4/67. Video Tape. A set of Montessori cylinders was on the table when Kent entered the testing room. JS guided him toward the table by gently pushing his body. When he reached the table, he ran his hand back and forth over the tops of these cylinders.

Kent was sitting in a chair with JS beside him. She removed one of the cylinders and Kent with his right hand, removed the one next to it, and immediately removed the second cylinder. Then he continued removing all the rest which he stood in a direct line in front of the cylinders nowusing his left hand. JS then gave Kent a piece of cookie, she then reversed the form so that the various sizes were no longer matched with the cylinders he had placed before him on the table. He quickly adjusted and put the proper cylinder in the other end of the form. When he has returned all of the cylinders JS commented that she was going to give him another one that was much harder. She removed the one cylinder and while she was putting it away and getting another one, Kent had his head directed at her and her movements. When Kent had removed all of the cylinders from the second form he began to put his fingers and his thumb down into the various depths, then pulled her hand over to the empty spaces and pushed her finger down into the holes. She then put one cylinder in and Kent immediately removed it. Then reached for another one which he tried in several positions before he found the proper place for it. When one of the cylinders tumbled to the floor, Kent down. During this time he was working with the cylinders he was singing or rather vocalizing. There was no distinguishable tune and it was mostly one sound from the back of his throat with an "N" sound. When he had completed this form, she once again gave him a cooky.

(2) At this point, JS put a ball and a bowl on the table. Kent walked from the table and moved around the room. She tapped to evidently attract his attention but he continued to wander for a few moments. He then returned to the table and she gave him another piece of cookie and then he wandered away. She bounced the ball on the table. There were observers in the room, but Kent could not keep these out or react to them. (ACTIVITY WITH BALL AND BOWL)

JS placed a puzzle of a duck on the table in front of Kent. She removed one piece, putting her hand over the remainder of the table. She first put it out on the table in front of Kent and he merely handled it. She then picked it up and placed it very closely positioned to its proper place, with a minimal push Kent replaced it appropriately. She then removed two pieces from the puzzle. This time moving them further away. Kent picked them up and placed them correctly. She continued to remove puzzle pieces; the next time three pieces, repeating her covering the remainder of the puzzle with her hand. When he completed each task successfully she gave him a small bit of cookie. Kent was standing while working on the puzzle and JS had her arm around his body. He didn't push against her hand or attempt to withdraw from this physical contact.

After the puzzle activity had been continuing for two or three minutes Kent slipped to the floor. JS said rather playfully, "La, la, la" to him and he returned the vocalizing. She gently pulled him up by the arms, gave him a piece of cookie and removed only one piece which he had not yet replaced at any time from the puzzle. She said, (3) "Just one more, Kent," he replaced the piece, she gave him another cookie. Kent walked away from the table, wandered a bit, and then went to stand beside the door with his hand on the door knob. She called, "Come on, Kent," she tapped the table several times and he remained by the door. JS then took him by the hand and pulled him back to the table, seating him on her lap, she held a paper cup which contained a few objects. She shook the cup several times so the objects rattled. JS tried several activities using the paper cup; tapping them on the floor, tapping them with her hand. Kent remained unreactive to all of these. He returned to sit on the floor beside the door and then she approached him and sat beside him continuing the use of the cups. Kent remained unreactive. When she tapped the cup she used a tune with the sounds, "La, la, la."

JS picked up a small rubber ball, bounced it a few times on the floor and then threw it toward Kent. With his left hand and primarily using his wrist, he slipped the ball back in her direction several times. She continued to move father away from him and he still returned it to her. Once when he had released it and it had not moved very far, he gave it another push with his hand so it would come close to her. After about ten throws he kept the ball and just moved it back and forth in his hand and turned his body from her. He then moved away farther putting his back in her direction. JS waited a moment or two then pulled Kent up from the floor by his arms. She left the ball on the floor, took his arm and began to jump him up and down continuing in the "La, la, la" tune. After several jumps his vocalizing increased in terms of more intonation, more closely duplicating the "La, la, la" and increased volume. His face also became more animated with smiling. She would hold him by his arms evidently waiting for some movement of (4) his body and he would bend his leg. As soon as he would emit some vocal behavior she would give him another jump. Kent would clap, giggle, stand up, return to his squatting position and she continued to jump him whenever he vocalized. This continued for a while, then she picked him up and his arm was around her neck. She cuddled him and he neither pulled away nor resisted her. She then put him on the floor and he went to the door, holding the knob. JS commented, "It's time to go, Kent." And the left the room (CF)

(5) 4?67 Video Tape. As Kent entered the room the Montessori form board and the duck puzzle were on the table. Kent sat down and removed all the cylinders. Note: JS planned to attempt this session without use of cookies for reinforcers. This was the first time she had done this. Kent returned the cylinders to their proper places as soon as he had removed them. She then pushed the cylinder farther back on the table and put the puzzle in front of him. She removed two pieces, he stood up and started to walk away. She pulled him back to the table and helped him sit down. He then handled the pieces which were on the table but looked all around the room, not moving them toward the puzzle form. He smiled and rubbed the table rapidly. She then did give him a cookie, and Kent began to move the puzzle pieces, returning one to its proper place. He then moved his head in the direction from which he had taken the cookie. He put two more pieces back and throughout this time JS was vocalizing using "La, la, la." Kent was also vocalizing but it was in the back of his throat rather than with his tongue. When all the pieces were returned, JS put a small bit of cookie on the puzzle and he ate it. She removed various pieces one at a time, moving them farther away from the puzzle form and each time Kent immediately returned it to its proper position. She then inverted a piece to investigate whether or not Kent would turn the piece around to fit properly. She gently held his hand which was touching the puzzle piece so his fingers moved the piece around. When it slipped into place, she again gave him a piece of cookie. The puzzle was then removed and two formboards were placed in front of him. JS removed about four of the cylinders, moved it close to his body, saying, "Let's see what you can do with it, Kent." After a moment or two she moved the second one away
(6) leaving only one form board and Kent was pulling all the cylinders out. The cylinders were of various depths and Kent would experiment moving it to various spaces. If one did not fit properly, he vocalized fairly continuously as he fitted the pieces in. Once or twice, JS removed the ones that had been improperly placed. Kent used both of his hands for this entire process interchangeably.

At this point Kent walked away from the table and moved to the door where he turned the door knob, several times. JS walked to where Kent was and put his hands together to form a cup and then placed the ball in them. She used her hand to hold the fingers in a cup, he handed the ball back to her once, she repeated the process of forming his hand into a cup, and the second time he held the ball without returning it until she took it from him. She returned it to him and this time he handled the ball, turning it and rubbing it in his fingers. She once again took it and Kent sat down on the floor, she gave him the ball and he again just turned it and tapped it. She began to bounce it very close to his body and he having his left hand on his knee, turned the palm upwards extended a bit toward her. She threw it into his lap and his hand moved toward it to cup around it, then put it on the floor and with his fingers, very gently pushed it in her direction. She returned it and this exchange continued with Kent returning the ball more frequently but still occasionally holding it and fondling it or licking it. After a few moments he sat staring off into space quite inactive and not reactive to her touching his body with the ball.

(7) While Kent continued to sit on the floor, JS walked to the cupboard and got a piece of cookie. She put it in a bowl but Kent then stood up and took hold of the door knob. He picked up the ball and moved toward her. She continued to hold the cup which contained a piece of cookie. She gave him the piece of cookie when he placed the ball in the cup. After jumping episode similar to the one in the previous video tape of May 2nd Kent returned to his room. The jumping continued to be contingent upon Kent's vocalizing. He was, however, less reactive to jumping than he had been the previous day. The jumping did, however, involve a new activity very briefly. Kent swayed his shoulders a bit and JS began to move in rhythm back and forth with his body. Vocal behavior was not a necessary condition for this rocking. When the jumping was over JS again picked Kent up and he leaned his head against her shoulder as he was emitting a kind of giggle. When his feet were returned to the floor, Kent spread out on his back on the floor and again assumed the inactive gazing off in space posture. JS extended her hands, helped him up, gave him a piece of cookie and he returned to his room. (CF)

(8) April 25, 1967. Observation of JS working with Kent

11:00 a.m. JS sat Kent at the table at the start of the session and held all of the objects on the table preventing him from playing with them until she got a cooky ready. Then she released the ball with the instruction, "Give me the ball." When he handed it to her she said, "OK" and gave him a cracker. In the interim between the next instruction, JS held on to everything to prevent his playing with them. He then went away from the table to a visitor who was sitting opposite him. She sat at the table tapping and when he continued to wander about under the control of the visitor she asked the visitor to move to another corner of the room behind her.

11:0;. Kent returned to the vicinity of the table where she picked him up and sat him on the chair. She then gave the instruction, "Give me the spoon" and at the same time held the ball so that only the spoon was available on the table. When he gave her the spoon, whe said, "OK" and handed him a tiny bit of cracker. "Give me the ball" was followed by him handing the ball to her and again reinforced by "OK" and a small piece of cracker. Then they rolled the ball back and forth across the table with a few seconds of lively chatter from JS and corresponding squealing from Kent.

11:02. JS rolled the ball off the table with an instruction, "Go get it, Kent." The floor of the room sloped toward her, so that the ball would roll back to her. She threw it down again, instead of going after the ball Kent began patting his hands at the same time squealing happily. JS began tapping the table in rhythm, apparently expecting (9) him to do the same. When he didn't she shifted toward a patty-cake game which didn't get very far.

11:03. "Let's get the ball" and she took him by the hand and led him to the ball. He still didn't pick it up, so then she rolled the ball to him. He caught the ball and rolled it back. She bounced it in front of him and he bounced it. They then began throwing it back and forth, three or four times.

11:04. In the interim, JS had gotten the second ball and they were passing the two balls back and forth. Somehwere along in here she gave him a tiny piece of cracker. When he threw one of the balls away from her--away from her direction rather to her--she terminated this part of the interchange.

11:05. JS went back to the table and Kent followed her. "Give me the cup" was reinforced by "OK" and a piece of cracker. "Give me the key" occurred with a plastic bowl in her hand into which she put the cooky. Kent instead of dropping the key into the bowl, with the key in his hand began reaching for the cooky. Finally JS removed the cooky from the bowl, held the bowl in front of him and when Kent dropped the key into the bowl, it made a nice satisfying klink, whereupon she gave him the cooky.

11:06. JS began tapping the table, singing in rhythm. When this didn't lead to any performance in Kent, she asked "Put the spoon in the bowl." Kent picked up the spoon, dropped it into the bowl, but it fell to the floor. JS demonstrated how it went in by placing the spoon in the bowl in a way that it stayed, at which point Kent very carefully placed the spoon in the bowl in a way that it retained the spoon. JS said, "OK" (10) and gave him a cooky.

11:07 Kent wandered off and JS sat at the table this time tapping the plastic bowl with the key. Kent remained at a distance. Then JS held up both the cooky and the key, and gave the instruction, "Put the key in here" pointing to the bowl. Kent came to the table and dropped the key into the bowl with a nice decided klank that it made when it was dropped vigorously.

11:08 Kent wandered off again, but remained in the vicinity of the table rather than going to the extremes of the room. "Put the ball in the bowl, Kent." He grasped the ball, but instead of putting it in the bowl he wandered off with it. JS followed him with the bowl, but the result was he did not put the ball into the bow.

11:09 Kent took both the ball and the cup in his hands and wandered off, but eventually returned to the table. He put the ball down and under JS's verbal instruction put the ball in the cup and then ran away. JS said "Very good" and she picked him up, hugged him, and they returned back to the table with Kent in JS's arms. When she said "Let's do it again, Kent."

11:10 Kent left the table once more with JS following him. JS demonstrates putting the ball into the bowl, holding a cooky, but there was no performance. Kent remained in the extreme corner, hiding behind me. At this point JS stopped playing with the ball and he remained in the same position. Then she carried him to the table and sat him on the table while she crouched in front of him.

11:12 On instruction to put the ball in the bowl, Kent picks up the ball and holds it in the bowl, but doesn't release it. JS tape the top (11) of his hand and perhaps loosened a finger, but held him in that position until he let go, at which point she said, "Very good, Kent." "Let's do it again." Each time she did this, there was progressively less activity on the top of his wrists necessary to get him to release the ball and he did it nine times, at which time she gave him a cooky and terminated the session. (CBF)

(12) April 28, 1967. Direct observation of Jeanne Simons

10:30 a.m. JS led Kent to a chair until he said down. First event was the ball and the spoon in the cup with JS holding onto the ball. With the instruction "Give me the spoon" after approximately 20 seconds of hesitation, Kent pulled the spoon out from underneath the ball. JS thanked him and gave him a cracker.

10:31 Kent lent the table and went to the observer. During this period JS bounced the ball up and down on the table and tapped the table snging in rhythm. As Kent turned away from the observer and approached the table she held up a piece of graham cracker.

10:32 Kent remained in the vicinity of the table, looking at JS. At this time she began singing a gay little ditty and tapped her hands on the table, and Kent began moving, obviously in rhythm to her songs. First he touched his left forearm with his right palm in rhythm and then reversed hands. At other times he waved with his hands in rhythm.

10:33 JS simply lifted Kent up onto her lap. She held a cracker out in one hand visible to Kent and began tappinghis hand to the table as she

sang in rhythm. His participation in this was limited to a relaxed
posture. The instruction,"Give me the spoon" led Kent to hand the
spoon to her and he received a cracker. JS then threw the ball off
the table and when Kent didn't leave to get it she took him off her lap
with a statement, "Let's go get it." When they got into the vicinity
of the ball, Kent showed no behavior controlled by the ball; that is, he
didn't pick it up. Whereupon JS picked up the ball and bounced it up
(13) and down in front of him, singing as she did it. On the second
bounce Kent reached out his hand and returned the ball to the floor;
that is there were about three bounces of which one Kent did without
breaking the rhythm of the bouncing. He squealed in delight as a result
of this and ran away in a direction of another corner in the room.
Then he returned back to the table. JS took the bowl and asked him to
put the ball into the bowl. He did and immediately ran away. JS
returned to the table where she took a cooky and Kent returned and ate
it at the table.

10:35 Kent looked into the box where the cookies were and JS replied, "There are plenty of cookies, Kent." JS's comment was probably a reinforcer for looking into the box. The fact that it was a reinforcer also implies that Kent was under the control of the details of her language.

10:36 Kent sat on the floor and JS sat next to him and they threw the
ball back and forth. Kent had a good, vigorous accurate throw which
propelled the ball over about 4 feet right to JS's hands. JS threw
the ball back to Kent by forming his hands into a cup and getting very
close, waiting until Kent was looking, and then dropping the ball into
his hands. Then JS got the bowl and asked him to put the ball into it.
Kent was sitting with the bowl between his legs. When he put the ball
into the bowl, JS showed him a cooky from the table, but he remained
on the floor. Then JS put the cooky into a bowl and covered the bowl
(14) with the cup and walked over to Kent and put the assembly with the
cooky inside on the floor next to him. Instead of opening the cup and
the bowl (at 10:38) Kent went over to the shelf and touched a magic
marker. JS immediately moved over next to him saying, "Let's try it,
Kent" and she picked up the magic marker with the one hand, a piece of
paper nearby with the other hand and made a wide broad swathe across
the paper. Then she handed the magic marker to Kent who is about 20
seconds marked up the whole paper. When he began moving away JS handed
the top to him, approximately in the position ready to insert onto the
pen, ans asked him to put the top on, which he did.

10:39 JS asked, "Do you know where the cooky is?" Kent walked back to the table. JS picked up the bowl with the cracker in it and placed it on the table next to Kent where he finally opened it up and took the cracker. JS then shifted over to throwing and catching the ball. Kent caught the ball but didn't throw it back and instead returned to the table. JS took a cracker from the box and once more asked Kent, "Throw me the ball," as she held a cracker up. She led him away from the table and Kent finally put the ball into her hand, although he didn't throw it to her.

10:40 Kent ran away from JS and she chased him playfully. Then they took hands while they danced to her singing. Following this JS pulled him up with both hands, reinforcing jumping. In other words, she would bend down and start to lift him up but hold back paced with the way in which he extended his legs into a jump. In other words, her pulling was specifically conjugate with Kent himself jumping. The amount of (15) pushing against the floor which Kent contributed was not great, but it was clear from the way JS was reacting that she could feel some muscular pressure of his body against the floor which she was reinforcing.

10:41 Kent returned to the table and without any prompting with JS away from the table, picked up the cup and the cat. JS simply remarked, "That's a cup, Kent; that's a cat" and he returned to JS as she kicked the ball in his direction. He lay down on the floor and she began rolling the ball towards his face which produced a lot of smiling and laughing. The incline on the floor returned the ball to her and she did this repeatedly. After the third time, Kent's hand which extended over his head, began waving and she shifted throwing the ball to the hand which he then pushed back to her as he lay completely extended on the floor. Then she got up and he got up and she asked Kent "Give it to me." He began to throw the ball but instead, moved forward with it and deposited it in her hand at which point she gave him a cracker.

10:43 Kent stood against the wall, picking at it and JS followed him and tapped the wall singing a rhythmical ditty. JS then said, "Let's find the ball and put it in here (the bowl)." Instead Kent went over to the paper which still remained on the table from his previous activity with it. "You want to draw?" "Let's try the green one." JS went to the cabinet and handed him a green magic marker and asked him to "Take the top off." Kent ran away while she continued to hold the magic marker. She didn't pursue this any more, but instead put it down and said "Let's go back to the ball, then."

(16) 10:44. JS put the bowl next to the ball with a cracker inside the bowl. Kent reached for the cracker but she simply held his hand or took the cracker out of his hand. He made several more attempts to take the cracker, this time she let him hold it, saying "You can hold it, but first put the ball into the bowl." Kent held the cracker for 10 or 15 seconds without attempting to eat it. Finally JS took the cracker back into her hands but still kept it out visible. At which point he put the ball into the bowl and JS commented approvingly and repeated the jumping game with Kent in which she was pulling him up specifically contingent on his cooperative jumps. 10:45 Kent left the room. (CBF)

Chapter 8
Appendix

(17) May 9, 1967. Direct description of Jeanne Simons and Kent.

10:49 a.m. Session began with a wooden duck puzzle out on the table, an ashtray, and some pencils and crayons. The puzzle was one of a duck with which he had worked several times before and had difficulty with the foot and the bill. Both of which are irregularly shaped and require attention to small details to fit in. She began with a piece he had already completed successfully the previous time, the feet. When he did this she shifted to the bill which he for the first time got in easily. When he reached for the ashtray, she removed it before he grasped it and put it over on the shelf. When he reached for the pencils she at the same time took a piece of paper from the shelf and placed it on the table. Then she grasped his hand from behind his wrist and guided his pencil in a circular motion, singing "Round and round we go," as she did it. Then as she moved his hand in a circle evidently sensing some of his own muscular control, she released the second and third fingers, now holding his wrist loosely with a thumb, the small finger, and the ring finger. Then as he continued to move around under her guiding motion, she then released all her fingers except the index finger which she looped under his wrist so that her finger was centrally supporting his hand. For the next 20 or 30 seconds her posture varied back and forth between firmly grasping his wrist, holding it with several fingers, or guilding it with a single finger depending on the degree of his own control by the pencil and the mark on the paper. The procedure was in general designed to keep him drawing, yet providing the minimal possible support for the behavior consistent with producing a circular line on the paper.

(18) 10:50 She substituted the magic marker for the pencil. First she demonstrated the magic marker by making some marks on the paper, then closed with saying, "This closes it," and she put the cap on. Kent took the pen from her hand and accidentally opened it probably because the top was on fairly loosely; then he closed it again. JS said, "Take it off," and Kent didn't comply. JS again demonstrated and there was still no inclination to even handle the pen. She then took a piece of graham cracker in her left hand, showed it to him, and then said, "Take it off, Kent."

10:52 Kent took the cap off the magic marker and made a circle under JS's general guidance, most of it accurring with her index finger as the sole control of his motions. When he finished the circle she gave him a tiny bit of cracker, perhaps a centimeter square. After about two turns around the paper JS said, "Let's put it on," then "I'll hold it" as she held the pen in front of him so that he could easily put the cap on, which he did.

10:53 JS took the paper from the table and replaced it with a set of Montessori cylinders which was the most difficult of the set. She exposed the cylinders to Kent three at a time by putting her hand over the rest. When Kent had taken out and replaced all of the cylinders in the set, at least once, she then pulled them all out and allowed him to replace them. In the middle of the episode Kent , bending over the cylinders, fell off the chair at which point she moved over to his chair and took him on her lap while he completed the set of cylinders.

10:55 JS gave Kent a puzzle which he completed immediately following which she said, "Very good." Then she replaced the puzzle with a stack of rings on a pole, the top of which was threaded and contained by a large wooden nut. JS unscrewed the top piece so that it was simply laying on top and asked Kent, "Put it in my hand." He tried minimally to get it off and on a second request when she showed him a cracker along with the request, "Give it to me," he finally completed it after six requests. Each time instead of giving it to her, he put it back on the post.

10:57 Once again JS asked him, "Put it in my hand," pointing to the nut on top of the post. After seven requests he put the nut in her hand only when she showed him a cracker in the palm of her hand.

10:58 JS took the nut and two of the rings off the post and this time asked him, "Put it back," pointing to the post instead of her hand. Within the minute he put the rings back, both in their proper positions but when he got to the top she asked him, "Put it in my hand." He put the nut in her hand when she showed him a cracker which he ate after he put it in her hand. After Kent put the nut in her hand she said, "Now we can put it on there" pointing to the post. Whereupon Kent engaged in the behavior that has had such a high frequency.

10:59 Kent began tapping on the table with his fingers much the way JS did to attract his attention when he wandered away. JS sang, "La-la-la" in rhythm to Kent's tapping. Kent then reached for a crayon and JS simultaneously reached for a sheet of paper. Kent then took a second crayon and played with the two crayons on top of the sheet of paper. JS then took one of the crayons away and guided his hand with the "Round and round we go" song. Once again fading out her support to a single finger. While this was going on she crumbled a little bit of cracker in the center of the circle he was drawing. Kent's line crossed over to the center, whereupon she let him reach for the crumbs but he didn't really take them all.

(19) 11:00 JS reached for a box of brighter crayons at the same time saying, "Let's get you some brighter colors." Once again they drew circles with JS supporting Kent's hand varying from three fingers to one finger. Following this JS took a bright crayon and made some zig-zag marks across the circle. This had little effect on Kent and she dropped it at this point.

11:01 JS said, "Let's put the crayons back" and she indicated--pointed to the crayon box. As Kent reached for the crayons in the box she removed them, leaving the empty box and once more instructed him, "Let's put the crayons back." "Put in the box." Within 5 or 10 seconds when Kent showed no inclination to move in the direction of the box, she said, "I'll put one in and you put one in," and she placed one crayon in the box which she then imitated by placing his crayon. Then she put a crayon down in front of him and repeated the process with Kent putting a second one in and she putting a second one in, and they continued this until all of the crayons were in the box.

11:02 "Let's find the ball." Instead of going for the ball Kent reached for the play dough and JS took it from him and rolled it across the floor using it much like a ball. Kent touched the box and rolled it gingerly but there was very little behavior compared to the amount of control that had occurred with the ball on prior occasions.

11:03 JS took the small yellow plastic bowl and the ball and asked him to put the ball into the bowl. Once again he showed no inclination to engage either the bowl or the ball. Whereupon she led him over to the corner of the room where he sat down. She sat down with him bouncing the ball in front of him. On previous occasions when she had done this he had reached out and bounced the ball vigorously. This time a perfunctory movement toward the ball was followed by some tiny crumbs of crackers from JS.

(20) 11:04 JS threw the ball to Kent but he showed no inclination to extend his hands or reach for it when it came in his direction. Then she asked him, "Give me the ball... Put it in here." He handed it to her once at which point she put a cracker in the bowl and then asked him to put the ball into the bowl. What happened here could be most easily described by noting that JS approximated the behavior in several stages. The reinforcement of handing her the ball also increased the frequency of putting the ball into the bowl.

11:05 JS began singing, "La-la-la" in a lilting refrain as she grasped Kent's hands in the characteristic posture which has been described in the previous episodes in which there is a reinforcement of jumping by JS pulling in synchronally with his pushes against the floor. In this case, however, Kent simply dragged and there was very little tendency to raise himself off the floor or jump. She then switched to holding Kent at a distance so that his weight was supported against her hands, at which point she rocked back and forth with him. Again there was very little control and Kent's performance was not reactive with this kind of interchange. Following which Kent walked away, but in walking away he began singing, "La-la-la" much in the manner of the ditty that JS has been singing. At this point JS picked Kent up, held him and moved out in a playful interchange with Kent in her arms.

(21) 11:06 Kent moved against the wall, tapping it lightly.

11:07 JS begins singing, "La-la-la" and began engaging Kent in the jumping game. There is little behavior of Kent's part who mostly hangs limp at JS's hands in contrast to the previous occasions when Kent pushed against the floor and jumped conjugate with JS pulling him up. Then JS picked Kent up and held him singing in rhythm to his vocalizations which by this time are increasing in frequency. Within 30 seconds she put Kent down to the floor who immediately went over to the radiator cover under the window where I was sitting, but I continued writing as Kent reached for the radiator over my legs and he soon went away.

11:08 JS tapped the top of the table and Kent began singing something like the ditty which JS had been singing. At this point JS picked him up again and Kent continued a fairly high level of vocalization, this time the songs were based around the syllables "De-da." JS sang in reply to Kent "De-da," and JS during the course of this, took a cooky which she held in her hand. Then JS danced around the room with Kent with a song something like London Bridge is Falling Down, except in tune with nonsense syllables. When Kent joined in with some vocalization which if one were generous, could be interpreted as saying something like I want a cooky, or give me something, she very quietly and without any reply handed him the cooky.

11:09 Kent spontaneously begins singing "La-la-la" and JS begins tapping the table over a cooky which is lying there. "OK Kent, it is almost time," and Kent immediately went over to the door, touching the knob. JS in tune to London Bridge sang, "We open the door, we go" and Kent's vocalization continues in parallel with this at a very high rate, at (22) times almost sounding like speech. Just before JS opened the door, she gives Kent a large piece of cooky about one quarter of a cracker's worth. (CBF)

(23) May 2, 1967. Jeanne Simons, Comments from Video Tape

Watching Kent here taking the cylinders out, he put immediately on the role. The impression is that this youngster may be compulsive by having to put them in such a neat row. I immediately turned the cylinders and he took the one from the left side and put it--the right side and put in the left opening. A real compulsive child would have been unable to do this. He would have had to put the cylinder in the exact place and location where it came from. So this was my first indication that Kent was not very compulsive.

I want here to make a few remarks about Kent wandering away from the table after he had finished the cylinders. Notice that at no time do I get him back physically. I didn't stand up and get him. I called his name, but most of his attention I got through making a sound on the table and pulling the electric cord of the microphone as Kent is interested. So I really did, I know that Kent is fascinated with cords, that moving the cord, he may come toward the cord and therefore a few steps closer to me which actually happened only when he was very close did I take him and got him back to work.

(24) JS and Kent with Ball: When I held his hands and threw him the ball or give it to him, he obviously objected. I continued for a few seconds and he did not, he objected but he did not withdraw. At the same time I did not insist that he keep his hands together or alone--I held them. When we watch Kent playing with the ball at the end when I hold my hands in a horizontal position on the table with the thought that he can throw the ball toward me, he hands me the ball; when he is right in front of my hand, he himself put his hands in a horizontal position before he actually put it in my hands.

It gives me the first inkling that this youngster may soon be ready to imitate things.

(25) JS and Kent with puzzle: During this whole session with Kent, I really tested him out as to how long he could stand to be close to a person, how long he could be kept interested in a certain puzzle. Also, I found out something of his ability to be frustrated and deal with it. At the end, I held him but it was more in a cuddly way although at the same time, I prevented him from leaving me. I held my hands around him and somewhere I held it on a solid object so he was almost encircled. At no time did he really try to get away, it would have been very easy to be a little bit forceful and get out of my arms.

(26) The episode with the paper cups: Kent had taken a paper cup, and I tried to see if I could have him imitate or do anything like shaking with a cup. I am holding my hands, one hand on his hands and the other hand under the paper cup. So while I do the shaking my hand that is holding his hand is--there is only a slight pressure of my hand. So I can feelif Kent is inclined to do the shaking himself. Here again, although he could have easily slipped his hands from under me, he didn't do it. I persisted with the cup, he was interested in it because there was some graham crackers in it. I couldn't really get him to imitate at this point.

Point concerning Kent leaving the room: What I tried with Kent, he had gone to the door before and I had simply ignored this, it simply was not time to go. This time he was touching the door and obviously ready to go, and I told him it was allright to leave. This, however, was not so much in connection with going to the door, it is the same as throughout the whole session, that here we have probably a stubborn child which I think is wonderful. But, from the very beginning working with a child and he wants to work one has to establish some thing that a power struggle is going to be avoided. There has to be, as far as I'm concerned, one little item that is going to be on my terms without having to curb an awful lot that may be on the surface negative behavior as stubbornness is. I feel it is so valuable that I would rather make the youngster aware that they are stubborn because it can also become a (27) terrific weapon. Then you have to step in in a more negative way, and in normal life stubborn children are not particularly liked. We forget, however, that before the child's stubbornness becomes a kind of handicap to the adult world or a negative thing it could have been a kind of guided into something very positive. If a youngster would not have been aware that this stubbornness is something so atavistic to his environment. There will be more on stubbornness.

(28) May, 1967 Teacher's report:

When Kent first arrived, he spent his entire day sitting quietly in a corner, ignoring the other children and wanting (or so it appeared) the other children to ignore him. The only thing he was really interested in was eating, which he did quite well. He objected to any kind of change. When he was indoors, he did not want to go out. When he was outdoors, he did not want to come in. His outdoor behavior was the same as his indoor behavior. He would sit or lie down on the ground and not move. It I tried to work with him, he would become tearful and refuse to work.

Although Kent still prefers to remain placid much of the time, he is starting to show some interest in the group activities, often following what is going on with his eyes. He enjoys individual attention and will work, mostly with simple puzzles and cylinders, as long as someone will stay with him. As soon as he is left alone, he will go back to a corner and sit. (He now, most often, will sit in the corner rather than lie down.) He sometimes will run around the room when something attracts his attention. He likes to play with string and is very interested (unfortunately) in any wires that hand loose such as those from a record player.

JS is doing some individual work with Kent in which he has shown a great deal of progress and about which she can give much additional information. (HW)

(29) Discussion with Miss S, Kent's therapist.

CF: Anna, can you describe what you remember about Kent when you first came to Linwood which was in May 1967, right? OK, who don't you just go ahead and comment on what you remember about him then.

AS: Well, way back in May 1967 when I first came I remember Kent as being very quiet and he was still mostly just sitting in a corner very inactive. Every time it seemed that I approached him he would just run around and flee to get away from me or people in general. I'd say during the summer he came out a little bit more, you could see a gradual progression. We had arts & crafts and he would go down and he really participated in the activities that were down there. Then it seems like there was another big step when he was very whiney and crying, and you didn't know really what was causing it. He would just scream and really have a fit, and now he has changed again, he seems very happy. There isn't too much crying without a cause that we can see and he seems to be showing more interest in people--his eye contact is very good now, he has picked up a lot of little songs that he hums and I'd say in general he is a lot happier than he was in May when I first came.

CF: Do you remember what he was like with people then? Was he affectionate, would he come toward you, or if you tried to touch him or pick him up did he pull away from you?

AS: For the most part, I would say he pulled away from people.

CF: If you tried to approach him, he would withdraw?

AS: Yes. The only thing he did like and which he likes even more now is rough-housing. I can remember Miss Simons coming in and swinging him and there used to be this little song, "Hello, hello," somebody would take his hands and somebody would take his feet, and really a lot (30) can be done with this, I think, because he really likes it.

CF: What kinds of behavior? What kinds of things do you remember that he did the most? When you first came, if you were to just give a little word picture of what Kent did during the day, what would your major impressions be?

AS: Then it would have been inactivity.

CF: Just sitting?

AS: In a corner or moving from corner to corner, and now he walks around a great deal, he involves himself in like his block building, and he'll really stick with that for a long time.

CF: That's another question you might comment on. What kind of activity, you said at first he just sat, did he use any type of toys or materials at all? Do you remember?

AS: No. I can just remember him sitting and that was all.

CF: What kind of materials, you mentioned the blocks, you might describe what he does with the blocks and is there any other kind of equipment that he uses?

AS: Well, the blocks are interlocking blocks, they are plastic and they really make a lot of noise. He can stack them, I don't know in how many different ways, he really does a lot with them. He rotates the colors and just the other day, he is something about matching colors--we had the rugs out for a rest time, we had these two trains (one is green and the other orange) he went over and got these two trains out of the cabinet and I turned around and they were matched correctly on the rugs --we have a green rug and an orange rug; if we have little plastic toys he will take them out and divides the colors a lot and he particularly now is interested in puzzles. The small puzzles with just four separate pieces, they are not the harder puzzles, but he takes those out and he does a lot of that, and he tries to be contrary.

(31) 5/68 Interview with Jeanne Simons

During the intake interview, Kent gave the impression of being like a small baby laying on its back waving its hands and feet up in the air. If something was waved or dangled in front of him, he would seem to be attracted by the string. When he was accepted on Day Care, he would come in or be carried in the room and immediately stretch on the floor in front of the front door or the Program room. He didn't stretch out like a baby but had his feet out. When someone would need to come in the room and he had to be moved out of the way it was like moving a bag of wheat. He would kind of resist. Then when the door was closed again, he would move back, or he would stay where he was for a while. If he had moved back further into the room, a child could step on him accidentally, as if he would be an object, and he would not react to it. He would just stay where he was without moving out of the way. He would not even move when the youngster would make another round.

I would say Kent has some of the classical symptoms of the autist: aloneness, remoteness, not aware of others, not feeling kind of pain or cold, not being aware of their body.

Observing him, he sometimes came in with a string, manipulating it on two fingers and he was pretty good at it. He was occupied with it for a long time. My approach was to offer him another string, in another color. He was kind of interested in it and exchanged it, got back to his old string. I then took four different pieces of colored shoe laces and tied the four together at both ends. I offered this to him and he really became intrigued, and I became intrigued with what he was doing with it. He put four fingers through it and manipulated the string. Although Kent gave the picture of remoteness, I felt that he was not as remote as other children. The moving-in on him could be done much faster. He saw me, I could take the strings away, offer him another one, take him by the hand, and very quickly he would allow me to pick him up and put him down somewhere else. I don't want to give the impression that this took place over a few weeks, but rather within a few months.

Within these few months, Kent would look at people when they didn't look, and then look quickly back. So this is an important difference from children who won't look at people at all. So he had some looking at people a little somewhat under his own control.

I have to say a little more about looking at people when they don't look, or aren't aware of the look. Many of the very withdrawn children may do that. But there was a different quality in Kent's looking at people. It's as if Kent realized that that's what he should do and what we wanted him to do. There was a teasing quality in it. It was not the quality of the qutist who will look and then quickly look back. But with Kent it was a teasing quality, and a controlling quality. If you asked him to look at you he wouldn't do it. He would have this kind of smile and as soon as you looked away, both of his eyes would be right on your face. What he didn't realize was that I could look out of the corner of my eyes at him. So I could observe this kind of behavior.

(32) His behavior in the dining room was and still is similar to what we find in many of our youngsters. He was a good eater and used to eat whatever he wanted.

We took him in residence and he had developed some aggression with a kind of biting behavior. When he came in residence it was a kind of easy transition. Even when he had been admitted to Linwood as a Day Care child, the separation from his parents had been easy. When he did come in residence he would eat whatever we would give him. He did the same with food that he did with people. He would take it on his own terms. He may eat raisin bread or peanut butter or chocolate milk for a long time and it is almost impossible to get anything else into him and we haven't tried very hard.

I think we should say something which can also be found on the video tape. He quickly responded to humming. His first vocalization was perfect humming. Whatever sound he would choose - la, la, la or anything. But he would practically do this day and night, over and over again. We have been able to give him different songs.

We cannot say this child talks, but with his speech--I have heard him repeat jello when I gave him some--he can go la, la, very well, so he liked jello at that time and he said jello after me. When he sings "Mary had a little lamb," he will give you "little lamb," but you have to listen very carefully because it sounds as if it has ten 'l's. So he gives it to you and looks at you as if it is kind of a game. It is kind of negative but it is definitely "little lamb." Even on the video tape you can see that he has been able to say "hello"--'l's are very easy for him.

He has been almost completely toilet trained. He wasn't trained when he came to Linwood. He may wet himself once in a while.

Sleeping is pretty difficult. He's usually up half of the night. We have no explanation for that. Again we go back to that there may be some organic difficulty, but it's not up to us to find out. He is very gay and sings through the night.

He is taking a little medication during the day to ease him down. He's very difficult during the night. We had him camping, and he sang through the night repeating one song over and over again in a loud voice. But he's a very happy child at night, but keeps everyone awake.

Kent likes to move his hands over rough surfaces. He seems to prefer rough surfaces that have a pattern or rhythm in them. Such as corrugated paper or sand running through his hands. Things such as play dough he will crumble into fine crumbs. He will make intricate patterns with the stacking blocks. There is also a pattern in what he builds--it is kind of artistic.

(33) June 8, 1967 Direct Observations just prior to lunch during a 7-minute observation period: Throughout the entire period Karen remained on a tricycle riding counter-clockwise around the table, looking rather smug, not smiling at all, and avoiding interaction with any of the other children or the staff. When one of the other children sat down in her path, she let out a peculiar howl that borders on a grunt. He moved, and she looked pleased and continued riding. When the staff announced it was time to go upstairs to get ready for lunch, she got off the tricycle without protest and stood and waited at the door until the group assembled. Les remained lying on top of the table, curled up most of the time with his thumb in his mouth. He did not look at the staff or at the children. As Karen rode past him on the tricycle, he did not move his eyes at all, and they did not even seem to focus on her. When the staff indicated that it was time to leave, he did not respond, and he was lifted from the table by BB. He went along with her quite quietly without making any protest. Kent was running around playing with one of the other staff members, and also interacting with other people. He came over to the observer laughing, and then walked away again. (One of the children pushed him headlong in amongst some large wooden blocks with which they were playing, and he got up quietly without saying anything and moved away.) Tina was playing with the wooden blocks with the staff member. She was laughing, stepping up and down as the staff member said, "Now we are going upstairs, now we are going downstairs." (34) At first the staff member's comments mainly followed Tina's behavior, but during the period of observation the game changed slightly so that the child was following the statements of the staff members as though they were instructions. She watched the staff member's face carefully, there was a good deal of ey-to-eye contact and her faces were

extremely lively. During a second period of 10-minute observation the children were in the little playground with AS and BB. Les was playing quietly by himself, his face quite unexpressive, walking around touching and sitting in a toy jeep. AS noticed him alone; she was at that time playing with two children. She went over to him and said to him, "Come over here," and took his hand. As they walked across he headed in the direction of Karen who was on a swing. She walked quietly with him, he grabbed hold of the swing and stopped it whereupon AS sang, "Stop Karen, stop Karen, stop Karen, stop" in a way that amused Karen so that she did not let out her usual howl of indignation at being interrupted. Then Les climbed in and sat with Karen in the double swing which AS pushed to start it, and then left them alone for the rest of the observational period. Karen remained quietly in the swing throughout this period, looking rather smug and content again. Tina was sitting in a little four-wheeled cart which BB pulled around in circles and the staff member sang. When she stopped the child clambered quietly out. BB gave her a ball which the child then played with by throwing and catching and rolling. Kent was quietly playing by himself, though he occasionally had an exchange with Mark with whom he seems to have a good deal of contact. Mark incidentally is the individual who pushed him down amongst the big (35) blocks and I have seen such exchanges frequently in the past between the two of them. The first observational period, Mark was playing with AS and Tina, climbing on and off the blocks. Just before the end, Tina moved away and Mark remained by himself. He sat the blocks out in an irregular row and walked along them as though they were stepping stones. He was doing this with a very pleased smile on his face when the call came to get ready for lunch. AS indicated that he should pick up the blocks, he at once left them and went over to the observer holding his hands up and indicating by his bodily stance that he wished to be picked up and swung. The observer did not pay any attention and moved away. The child followed. BB then came over and persuaded the child to come back with her. Then by partly instituting the task herself and assisting him, she got him to tidy up the blocks. Second observational period, Tina was lying on top of a table under an umbrella of the pallid, sun-shade variety which she had just put out. (JLC)

(36) June 22, 1967; 11:00 a.m.

A group of small children was observed for fifteen minutes, just prior to the lunch break. When the observer entered, there were three staff members present.

JS entered the room during the observation, and at one point requested all of the staff members to watch Kent because they had taught him something new. JS stood behind him, he held his hands over his head without being asked and she took hold of them and then said, "lift your foot." At that point, Kent did as asked. JS asked AS apparently to take hold of the child's leg. At this point, however, he would not perform. After two or three minutes, BB came in with Tina. JS then said, "a-h-h, we need BB." BB came and stood in front of Kent and at that point when he was told to raise his leg, he did so, and the two of them joined him singing, "One, two, three, up we go." After this episode, JS brought Kent over to the observer and in that setting he would lift his leg so that the child was swung again.

12:10 p.m. OUtside in the toddlers' playground.
BB was not present; AS and PP were sitting in the corner of the play yard and were singing.

Kent and Mark were in the sand pit and sat there quietly playing throughout the whole play period. Kent was sprinkling sand on his knees which were slightly bent as he sat. He remained there almost until the end when he finally climbed out and went over to the swing. (JLC)

(37) June 29, 1967; Direct observation of Kent with three staff members present in a free-play period. Throughout most of the group observation Kent was wandering around occasionally smiling. He avoided Mark who tried to annoy him on several occasions; he once came and hid behind the observer to keep away from Mark's unwanted attention. During this period of observation, it was quite marked that the staff was predominantly interacting with the little girls. I did not observe them interact with Kent at all. (JLC)

(38) July 20, 1967; 11:00-11:15 a.m. Direct observation. When the observer entered AS was sitting at the opposite side of the room from the door on a piece of furniture under the large window. BB was seated in the right-hand corner beside the screen, with a door, which is painted like a child's house. A child-care worker was sitting at the small table. With BB were Karen and Tina. Close by them was Dorothy who was riding on a tricycle watching but not joining in. Karen and Tina were taking turn-about of going inside the door and closing it, at which point BB would sing when Karen was inside, "Hello, Miss Karen" and would knock at the door. Karen would laugh and squeal and finally open the door at which point Dorothy would go in and close the door and BB then knocked again, singing "Hello, Miss Dorothy, will you let me in?" This game continued for five minutes. AS would call to whichever one of the two emerged and they would laugh over to her as she smiled on their emergence from the little door in the screen.

Kent was walking around and around the room. He did this throughout the whole period of observation until JS finally came in appeoximately two minutes before the observation periodid ended. The first time Kent walked past the observer, he stared up at him, smiled broadly, continued on his way and said, "lo." There was a slight aspiration in front of the lo so that it almost sounded like hello. Occasionally as
(39) Kent walked, he pulled up his shirt and put it in his mouth.

After perhaps ten minutes of observation as he was walking around the two little girls playing with BB had left and were playing with Dorothy. The three of them climbing on and off the tricycle and the plastic rocking elephant. As Kent walked past BB, she called, "Hello, Kent," and he walked over and stood beside her, climbed upon the piece of furniture on which she was sitting. She, however, was still watching the three little girls. Kent climbed down and walked away. Mark was walking around, holding in his right hand a wooden, red, hexagonal block--shaped like a stop sign on which was written stop. He kept holding this sign up about his head. After seven minutes of observation, he came over and smiled up at the observer who did not respond.

(40) As Kent walked past the observer and JS, she took hold of him and said, "Put your hands up, Kent." Which he did. She then said, "Give your foot to JLC," which he did and we swung him. At the end of the swinging he looked up at the observer who had held his feet and said, "Hello." JS and the observer then indicated by patting him and smiling that they were pleased. He then grabbed their hands and started to swing them. This did not control his behavior, however, and he then wandered off. (JLC)

(41) July 20, 1967; 12:00-12:15. Direct Observation. Kent, Mark and Gerschen were playing in the sand pit. Kent remained in the corner on the right facing toward the corner. Somehow, in a way that the observer could not see, throwing sand up in a fountain between his legs so that it came down sometimes on his face and head. Throughout the whole period he seemed to be laughing and chuckling and his lips were moving. Toward the end of the observation period when Caesar came in, he walked over and said, "Hi, partner" to Kent who got up and moved. MJ laughingly called to Caesar, "Why should he be interested in your black face when there is all that sand there for him to play with?" C made an equally jocular remark back. Kent looked from one face to the other, smiling. C reached over and pulled some poison ivy which had grown through the fence since the night before, saying, "I had better watch this." Kent reached for the poison ivy, C kept it out of his reach. Kent then returned to his corner and continued with his sand playing. Gerschen remained in the sand pit for the first ten minutes, then climbed out with a pile of sand in his hands which he placed on the grass beside the sand pit, and sat apparently rubbing it into the ground and then pulling it together again in a small heap. Mark remained quietly in the left-hand corner of the sand pit, running sand through his fingers and making small sand piles with it. When the observer first came, BB was sitting in the big swing with Dorothy on her lap. They were practicing saying, "Red balloon,
(42) yellow balloon, white balloon," and were laughing all the time. AS was joining in on this though she was standing at the other swing in which Karen was sitting. Tina was riding around on the cicycle. She at times went over to either AS or BB and said something inaudible to the observer which attracted their attention.

Les at the right-hand side of the play area close to the small log cabin was playing with a folding picnic-type aluminum and plastic chair. He would set it up, sit on it, allow it to roll over with him in it, climb out, set it up again, and repeat the process. He did this until some ten minutes of the observation period were over when AS and BB left for lunch and MJ was the only one looking after the playground. Then MJ attempted to attract his attention and get him into the wheelbarrow. He left the chair, went over and picked up a plastic bottle, looked over at her and then made a sound of lalling type which sounded at first like, "piff, piff, piff" and then "biff, biff, biff." He did not go over to MJ however, and wandered up and down on the side of the playing field closest to where the observer was standing watching.

As BB and AS left, Dorothy ran after them. They left by attracting her attention, she looked over to MJ, they left and locked the door behind them. Dorothy went into the little porch behind the screen door and began to bang on the closed door. MJ walked over, taking a trolley cart with her and tried to persuade Dorothy to climb in. Dorothy, however, came out from behind the screen door quite calmly and pulled (43) the red cart back across to where the other children were playing. (JLC)

(43) July 27, 1967. Direct observation: The children were preparing to go out swimming. Kent was all dressed and ready to go out. He was walking around the room. The observer noticed that he stuck out his hands rather indiscriminately at various things as he went on. During one occasion, slapping vaguely at Terri on the back as he went past her. He was also rather noisy letting out shouts, and smiling.

(44) July 27, 1967; Direct observation. When the observer entered, Kent was lying on his face in the open cupboard un der the window on the right with AS sitting beside him singing, "Twinkle, twinkle, little star." He lay quietly not moving with face turned towards the window. However, occasionally there was almost imperceptible movement of his left arm beating time to the song as the staff member sang. Tina was on a tricycle circling close to both of them, after two or three minutes she climbed off the tricycle and joined with AS, finally climbing up herself onto the top of the cupboard lying partly on top of Kent who did not move and paid no attention. (JLC)

(45) August 31, 1967. Video Tape. JS and Kent are in the therapy room seated behind a table. JS has placed two Montessori cylinders before Kent on the table. One set of cylinders is directly in front of the other placed directly in front of Kent.

As JS adjusts these Kent is looking off into space perhaps at the video equipment and JS is singing, "la, la, la." She removed three of the cylinders from the form directly before Kent, continuing to sing. At this point Kent looks down and puts his hand on the cylinders which

have been removed. Without looking at JS or waiting for a command from
her, Kent begins to remove all of the cylinders. When he has removed
all of the cylinders from one form she pulls the empty one away and
places the other one before Kent and he immediately begins to remove
all of these cylinders again without looking at JS. He is using both
of his hands for alternately removing the cylinders. When all cylinders
have been removed from both forms, JS places both of the empty forms
in front of him saying, "Now let's see what we can do, this is very
difficult." At this point Kent stands and reaches across the cylinders
so he can put his fingers in the empty spaces. He puts his index finger
in one empty form and his thumb in a space of the other empty form and
moves his fingers up and down and back and forth. JS then placed one
of the cylinders beside the form, Kent looked toward it and put it back
where it has been before. Kent continued to put his hand in the empty
spaces and flutter his fingers. After a few moments JS removed one of
the empty forms and put it behind Kent. His eyes did not follow her and
he continued to explore the form. Once again, JS placed one of the
cylinders on top of the form and immediately Kent put it back where it
had been continuing to use his left fingers in the empty form. JS put
(46) her finger in one of the spaces and he pushed her hand away. After
a few moments she picked up a cylinder and began to insert it in an
empty space and Kent once again pushed her hand away very quickly, but
without looking in her direction or changing his expression. During
this time she continued to hum softly under her breath. JS then put one
of the empty forms in front of her and picked up a few of the cylinders
saying, "This is mine, that is yours," and inserted two or three cylin-
ders in the proper form repeating, "These are mine, and that is yours."
Since all of the cylinders were directly in front of Kent she would
reach around him to get the one she needed for the form she was using.
After she had inserted several in the form Kent picked up one of the
cylinders and began to move it back and forth in his own hand and look
at it. He then set it down and returned to his former activity of
rubbing some over the tops of the empty cylinder spaces. He then
walked away from the table over to a part of the room where it is not
evident. JS tapped one of the cylinders on the table for a few seconds
and then said, "Come on, Kent." She then stood up and reached for
Kent's hand saying, "This is your cabinet here Kent, you may take some-
thing from this." When she was holding his hand he moved with little
resistence back to the table looking at the cabinets which she had
indicated. Continuing to hold his hand as he was sitting down but
still looking around the room JS pulled a can of play dough from the
cupboard and set it directly in front of Kent. His eyes focused quite
intently on the can of play dough and JS moved it just a few inches
away from him saying, "Here let's put these away first, then we can play
with the ball," referring to the cylinders. Touching his hand she
directed it to the cylinders and guiding his hand, holding it gently,
picked it up and dropped the cylinder in one of the spaces. Kent's
(47) eyes continued to be on the can of play dough. JS said then, "let's

put another one away," and as she directed his hand to the cylinder put the play dough in her lap and covered it mostly with her arms. She then put a cylinder in his hand but did not hold it or direct it toward the cylinder. Kent took it from her, held it firmly, but then stood up as if to walk away from the table. She immediately took a hold of his arm and gently pulled him back to his chair. Kent smiled and looked around the room but did not look toward JS even when she touched him or pulled him gently. When he was sitting she moved the can of play dough toward him saying, "Let's open it up," and she took the lid off, removed the play dough, and as she was holding it in her hand Kent reached toward it. While holding the play dough in her hand she pulled her hand a bit away from Kent and handed him a cylinder saying, "Let's put it away." His eyes again continued to be directed on the play dough, now in her hand. She briefly moved the play dough toward him and then pulled it away then with her other hand put the cylinder directly in front of him. This action was very quick and followed immediately her rather quick presentation of the play dough toward him. She then picked up one of the cylinders and put it over--held it over the appropriate space in the form. Kent pushed her hand away, looked toward the play dough and stood up moving his body and hand toward the play dough in her hand smiling rather broadly as he did so. She opened her hand showing him the play dough, moving it toward him a little bit, then pulled it away immediately reaching for a cylinder which she placed in the proper space and handed Kent one saying, "Now it is your turn," which he held. She said, "Now it is your turn, put it in this one," pointing to the proper space. Kent continuing to smile immediately dropped the cylinder in the proper place. She then handed him another one but did not point to the proper place and Kent quickly put it in the appropriate place. Then with no prompting from JS immediately (48) picked up another cylinder placing it in. His eyes were on the cylinder at this time. He then placed another one in which was not appropriate. JS said, "uh- uh," softly under her breath and quickly pulled it out, selected another cylinder which was appropriate and placed both of these in the form. His eyes had not returned to the play dough. He would pick up the cylinders with both hands but use his right hand to actually place the cylinder in the psace. He then made an incorrect selection but quickly seemed to detect that it was not deep enough and pulled it out immediately replacing it with the one in his other hand which was correct. Up to this time Kent had proceeded in the position of spaces in the form board and had been doing them in sequence. There were ten cylinders and on the eighth space, the cylinder he had selected was not appropriate and actually went in the ninth position. Instead of searching for the appropriate cylinder, Kent simply put it in the tenth position, therefore for the first time losing a position unfilled. He then completed the entire form and rubbed his hands over the tops of the cylinders. While he had been working JS had continued to jum softly. When he completed it JS handed him the ball of play dough and a small container which she placed in

front of him. Very briefly while she with the other hand removed the form board placed a larger rubber ball in front of Kent and pulled the container and play dough into her lap. She rolled and play dough around in her hands vigorously for a few seconds, then held it, saying to Kent, "Give me the ball," referring to the large rubber ball in front of him. He pushed it away and then without touching it any more smiled, but turned away from her and spread his arms out on the table and put his head down briefly. He then took up the ball and gently bounced it on the table with his right hand for four or five times but not looking toward JS. Kent then put his head down as if to rest on the table but his head was in the direction of JS. She rolled a little ball of play dough on the table a couple of times saying, "I'll roll this ball," then taking the rubber ball rolled it back and forth in front of Kent saying, "You roll this one." Kent's arms were still extended on the table, and
(49) JS reached around him and put her arms gently around him so that her hand was resting on top of his. She, using little pressure,put her hand over his and moved his hand and arm back and forth behind, along with hers behind the rubber ball so it rolled in front of him, saying, "That's my boy." As it rolled from the push with his right hand he reached his left hand out to stop it and tap it. He used his left hand to carry and place it in his right hand. The smile was broad and you could hear soft vocalizing sounds. Her hand remained over his while she was saying, "Let's roll it, let's roll the ball." His fingers were curled around it, holding it which would have made rolling it and releasing it difficult. JS said, "Let's make a ball," and she picked it up and rolled it into a more round shape in front of her. Kent continued to smile and vocalize. She then placed the play dough ball in front of him and his hands pulled together around it... and rolled the round rubber ball round and round in front of her and then rolled it against Kent's hands. The second time she did this he released the play dough and it dropped to the floor. She said, "Go get it Kent, go get it," and he immediately left the table, retreived it from under the table, and continued to sit on the floor playing with the play dough rolling it back and ofrth in his hands and dropping it on the floor. JS took another piece of play dough and bounced it on the edge of the table close to Kent saying, "Come on, come on," and then left it sitting there pulling her hands away. Kent remained on the floor and had begun to set up the ball of play dough into tiny little pieces with his fingers. At this point JS went to him and picked up the play dough and returned to the table with all of it. Kent began to walk around the room toward the windows. JS took his arm and this time pulled him onto her lap. The play dough was sitting on the table and Kent immediately picked it up. While Kent
(50) was holding the play dough JS took part of it away from him, "Let's make a smaller ball." Then she gave Kent a smaller piece of play dough. As JS divided the play dough she said, "Let's do something else with this, make a tiny little ball, that's yours and this one is mine." Kent appeared to be intent on his small ball of play dough and JS swung his feet around saying, "Let's sit someplace else." Kent appeared to go a little

limp and sank down to the floor. JS chuckled ans said, "Come on, Kent." He didn't look toward her but continued to have his eyes on the play dough in his hands. She gently directed him toward his chair saying, "You know Kent it is a very hot day." He sat down, again his attention on the play dough, without looking toward JS. His hands released the play dough onto the table and JS picked it up into one large ball and moved the small container closer to him. She continued then to hold the play dough in her hands and opened them quickly saying, "Put the ball in here," and placed the rubber ball in the container in front of Kent. He smiled and immediately picked it up in his right hand. He threw it across the room. JS picked up another ball this time holding the container in her hand saying, "Put the ball in here Kent," and he picked it up and dropped it in the container. JS followed with, "That's my boy," and gave him the small ball of play dough. She had held the ball above the container and dropped it in leaving it there for Kent to pick up and drop in which he had done. Kent picked up the piece of play dough and began to handle it, putting it down on the table. She gave him the ball again and Kent held it as if to throw it across the room. JS said, "Uh-uh-uh," and moved the container toward him almost directly under the ball in his hand. Then she put her hand on his arm and tapped it gently so the ball fell into the container and she followed with "That's my boy." She then put the container on the table and the ball beside it saying, "Put the ball in there." Kent looked at it for a few moments, then began to stare off in space it appeared. She moved the container a little
(51) closer and also put the play dough container in front of Kent. Then she picked up both the container and the ball saying, "Put the ball in here," holding the ball close to the container. Kent became preoccupied with the small fleck of play dough on the table, picked it up and threw it down several times. At this point JS put the container on top of the play dough can in front of Kent on the table, then holding it close to Kent handed him the ball. He bounced the ball very gently a few times but continued to look off in space. JS began singing, "La, la, la," but Kent continued to assume a rather removed appearance. JS bounced the ball several times. Kent then picked up the ball and threw it across the room and it bounced back. JS said, "Very good," picked up the ball and put it back in the cupboard. Also the play dough was removed and put away. JS put a box of crayons in front of Kent removing the lid and then covered the crayons with her hand while she got a piece of paper. While Kent's eyes were on the paper JS, taking a crayon, drew a circle and as she made the motion saying, "Around and around and around we go," Kent's eyes followed her movements on paper. When she had completed three or four circles she lay the crayon down on the paper in front of Kent. Kent looked at it for a few seconds, then picked it up, studied it once again, then banged it on the table. While Kent was still holding the crayon JS guided his hand to the paper and very delicately holding him by the wrist as he was gripping the crayon she guided his hand round in a circle on the paper. He released the crayon and then picked it up again and tapped it on the paper. Once again JS gently held

Kent's wrist supporting it with her index finger and went round and round on the paper. Kent seemed to be gripping the crayon independently and the pressure from her finger merely guided it in a circular motion. JS selected another crayon and Kent picked it up but then released it and
(52) reached for another crayon. JS commented, "All right you'd like a blue crayon," and he dropped the second crayon and reached for the other one which placed two on the paper. So JS commented, "Well, you can use two Kent," and putting both in his hand she again applied a small amount of gentle pressure to his wrist to begin the circular motion. He resisted the circular motion and pushed his hand off to the side making straight lines and then dropped the crayons. JS put another crayon in his hand and he reached over and put it in the box. At this point, JS placed the lid to the crayon box beside the box saying, "OK, let's put the lid on Kent." Kent immediately sand to the floor.

(53) JS had just put a ball away following Kent's ball throwing and ball rolling. As she put the ball back in the cabinet and reached for a box of crayons which she placed on the table in front of Kent, she held onto his shirt and then onto his arms. He smiled and did not evidence any struggle to pull away from her. Kent removed the lid without any assistance and JS placed her hand over the box of crayons while she reached for paper which she put before him. While she reached for anothe piece of paper, Kent stood up and started to walk away from the table. She pulled him back. JS then picked up the crayon and made a circle on the paper singing, "Around and around we go," Kent's eyes were on her; she then lay down the crayon and Kent immediately picked it up, looked at it and then tapped it on the table. She reached around his shoulder and gently held his arm. He held the crayon and she guided his hand around in a circle again singing, "Round we go." Kent was not completely passive in muscle tone and seemed to pull a bit away as she went around in a circle, he then dropped the crayon. JS commented, "Have you ever seen such a little negative boy?" Kent tapped it on the table and then began to tap crayon in the air with his finger. She repeated the circular formation and he followed her hand support for three or four circular motions. She then turned the piece of paper over, handed him another color which he took in his fingers, but immediately dropped and reached for another crayon. She gave him this crayon and he placed the
(54) two together, she put one back and he continued to hold the other one. Then again reached for another one, trying to hold the two together. JS then placed the two crayons in his hand to begin the drawing in a circle motion. He had the two crayons, she again helping him by giving support to his arm. He soon dropped the crayons and then picked them up with his other hand. She gave him another crayon and he put it back in the box. JS said, "All right Kent, put the cover and then we'll put them away." Kent stood up then sank to the floor and moved his body away from her. She reached for him and pulled him back and he was rather limp. He had not looked at her during this time. JS put her arm around him, held the ball in front of him, partially placed the cover on the

crayons and said, "Let's put the cover on, then we'll play ball." Kent again sank to the floor smiling. JS put him on her lap and again picked up the cover, put his hand around the cover, moved them over the box and tapped his fingers so the lid fell into its proper place. She put it away on the shelf. Kent walked away from the table and over to the television apparatus and felt the monitor, then put his face very close to it. Then he moved to the spinning wheels at which point an adult moved his hands away. He continued then to walk rather randomly around the room until JS pulled him by the arm over to the side of the room. She pushed gently on his body until he sat down on the floor, and handed him a ball. She moved a distance away and extended her hand saying, "Come on," and he threw it in her direction rather gently. She returned it to him and he looked rather vacantly around the room, then (55) just fingered it in his lap. She then added a cardboard box which she placed between them and picked up another ball which she began to drop in the box. She then moved the box toward him but Kent continued to look away and felt the ball in his hand. She picked up the ball he was holding and then began to drop it in the box which she had now moved very close to his body and gave him the other ball. She touched the box against his legs saying, "Come on," and repeated throwing the ball in the box. Kent continued to look around the room and handle the ball he was holding. JS then held his hand over the box and gently tapped the ball so it fell in the box. She then used both balls and repeated this several times continuing to tape his arm gently so the ball fell in the box. Kent then crawled on his tummy underneath the table and began to pat the table leg smiling as he did so. JS took his arm and pulled him back and began to sing, "Skip to My Lou," using "la" vocalization. She said, "You're full of mischief today, Kent." She held his arms and faced him and pulled his arms upward. Kent again walked away from her. She then followed, this time pulling him toward her face to face and picked him up under the arms and bounced him two or three times. Kent smiled but when she set him down once again he walked away. She commented, "You're noticing everything today Kent," as he walked back to the television equipment. At this point JS held his arms and walked him back and forth singing, "Row, Row Your Boat." His body seemed to resist her a bit and right then shen she let go he walked away. A little later in the observation, JS picked up a whistle and blew on it several times, then handed it to Kent. He dropped in on the floor after handling it briefly. She repeated blowing on it and handed it to him, he accepted it once again, then dropped it on the floor. JS then said, "Kent say no if you don't want it." Kent put his head on her arm, and she said, (56) "No, no biting." Kent again moved away from her and picked up the whistle. He sat with his back towards JS and shook the whistle using it as a rattle. JS put her hand around his and began singing, "La, la" in the rhythm of the whistle rattling. He stood up and walked away. He walked over to the window, climbed up on the radiator and sat on the window sill. JS walked over and held him saying, "I'm going to let you go now, Kent, good-bye." (CF)

Chapter 8
Appendix

(57) 9/67. Direct Observation - Toddlers' playground. BB was alone with six children, she was pulling around a red cart giving rides to any child who wished to step in. Kent was playing in the sand pit as was Mark. Kent remained most of the time in the sand pit, except after eight minutes of observation, two of the summer workers walked in carrying a table which they were setting up as a play area for the children. As they came through, BB was preoccupied with another child. Consequently for about 20 seconds the door was open, and during that period Kent glided through. The care-workers turned and chased him, when they brought him back he was gleaming and with great delight, and returned without complaint to play. Not on this occasion to the sand pit, but in the little log house that is beside the sand pit. (JLC)

(58) 9/67. Direct observation - the toddlers' room. Kent and BB were sitting on the floor by the door and BB was occasionally singing to him. Kent occasionally fussed and scolded. He was surrounded by a series of plastic blocks, cups, etc. As the observer watched, he began with BB's assistance to put the cups together. BB's technique was merely to set the cups with the open end up, but not in order. Kent picked out the appropriate ones, sitting one into the other exactly and rejecting the ones which were not of the immediate next smaller size. He gradually built all the cups up until he had them stacked one inside the other. His fussing came when he thought BB was trying to take over the work from him and I noticed that she was sensitively aware of this and immediately stopped when he scolded.

After BB and Kent had given up their game with the cups they began pushing a small wheeled vehicle between them. Mark then went over and intercepted the vehicle. Kent protested with a roar of tooforay and BB said, "We are playing with that Mark." Mark went back to where his little wheeled toy was and brought it over to give to Kent. Kent quieted down and Mark joined them again, but Kent resented every time he stopped the wheeled toy as it was being pushed between the three.

Throughout the period of observation the children were, with the exception of Kent who occasionally yelled, rather quiet, self contained and busy about their activities.

(59) 9/67. Direct observation. As the observer entered the room there was a great deal of activity and noise in the room. The children were shouting, screaming, crying and laughing. Kent was wandering around making a great deal of noise, he walked behind Mark who stood up and got hold of his collar. Kent yelled furiously and pulled himself free walking to the back of the room where he strutted up and down, putting his hands to his ears and occasionally emitting a yell.

Later in the observation when JS had entered the room, Les walked to the observer and in doing so got in Kent's way. Kent pushed him aside energentically and slapped at him. During this time JS had picked up three cans, set them on the floor and had begun to roll the ball to knock over the three cans. At the beginning of this activity Kent was fussing at the door and JS mentioned that perhaps he was hungry since it was close to lunch time. However, he became involved in the game of rolling the ball, though he would not roll it at the cans but instead threw the light plastic ball up so that it bounced off the ceiling. When he did this, he also laughed. (JLC)

(60) Direct observation. The younger children were all in the dining room for lunch. Mark and Kent were sitting at one table beside the window. Kent was sitting on a bench with his back toward the window and Mark was seated directly opposite him. They were the only two children at the table. As the observation began, Kent was chewing on a peanut-butter sandwich. The sandwich had been cut in half, and Kent had stacked the two halves together and was chewing on them at once. He was making singing sounds very softly under his breath while he was chewing and looking around the room. With his right hand he sat the sandwich down on the table and then using both hands separated the four pieces of bread, lining them up in front of him on the table. He had all of the crust sides away from him. Using his right hand, he would alternately pick up different pieces, take a bit of them, set them back down. He left the crusts. While he was chewing, he lifted both of his arms in the air and waved them around, and continued to hum softly. He made a sweeping motion on the table with his right hand, and the pieces of bread fell to the floor. He didn't look down at the floor to see what had happened to the bread. AS walked to the table and handed Kent a glass of milk. He held it in his right hand and drank most of the milk. He would continue to hold the cup close to his mouth while he took a breath, but did not set the cup back downon the table until he was through. AS took the cup away, and Kent rubbed his right hand around on the table where there appeared some peanut-butter. Meanwhile he was swinging both feet back and forth under the table. AS brought another sandwich and held it in front of Kent. She was holding it very (61) gently, so it was easy for him to take. He looked at it a few seconds, and then took it with his right hand and began immediately to take bites from the center of the sandwich. He began to kick his feet back and forth rapidly under the table. Once again he began the singing sounds and hummed up and down the scale--it was not a monotone. While he was chewing and humming, his left hand rubbed back and forth on the seat beside him. He slid out of the chair grinning and walked to the middle of the room, still holding his sandwich. He began a larger smile and shrieked. AS looked at him and walked a few steps toward him and said, "Kent we sit at the table." He smiled and she put her hand on his shoulder and with a rather slight pressure moved him toward the table. He complied and sat down once again requiring no more physical force from her. AS then brought two more sandwich halves to Kent and once again held them out to him. He looked again several seconds, then took

both halves with his right hand, and using it as one big sandwich, bit through all four slices of bread. He continued to hold the sandwich in his hand and took two or three bites, then sat it down on the table. Kent then lay down on the seat, AS removed his plate and put one cookie on the table in front of him. He sat up, picked up the cookie and began to chew immediately. While he was chewing, he then climbed up on the back of the bench and began to move his body back and forth a bit. AS walked over and said, "Sit down, Kent." He smiled, waved his arms around; she moved closer to him and he slid down with what sounded like a giggle, and continued to smile. The other children had begun to leave the dining room to go outside. AS said, "It is time to go out now, Kent." By then all of the others had gone. He lay down in the seat once again and smiled. Miss Singer took his hand saying, "Come on, (62) Kent." He smiled and walked out of the room with her. A few seconds later, Kent came in the room again, looking behind him toward the hall. He lay down in his seat, AS walked in saying, "Come on, Kent we are going outside." She took his hand, he continued to smile holding onto her hand and walked outside with her. (CF)

(63) 10/67 Direct observation. The children had just returned from a walk; it was time for snack and all the children except Kent were sitting around the tables. As the observer entered the room and walked over to sit in a chair, Kent walked past her moving toward a toy cupboard. As he walked past his eyes were on the observer and held eye to eye contact. There was, however, no particular expression.

Kent walked to the toy cupboard and sat down on the floor in a squatting position with his legs folded under him and up inside. He retained this position for just a few seconds and then lay on his stomach on the floor. With his right hand he rubbed two pieces of plastic cylinders together, but did not focus his eyes on the cylinders. His head was turned toward the center of the room where the children were sitting. His eyes seemed to be focused on Les who was crying, but once again there was no particular expression on his face. Kent then stood up and walked to the black cabinet and lay on his stomach on top of this for just a few seconds. He then stood off the cabinet and walked to a rug which was on the floor, and lay on it on his stomach. He immedaitely turned over and put his feet straight up in the air resting them against a cabinet. He remained in this position for only a few seconds; stood up and walked back to the toy cupboard. He again sat on the floor assuming the same squatting position he had earlier and again picked up the plastic cylinders. He picked up an orange one without any apparent selection and pushed it around on the floor. Kent then rubbed his eyes, using both of hands and his mouth was pulled down at the corners as if to cry. However, there were no sounds or tears.

Kent then walked toward a toy cabinet in the center of the room and lay on top. He was holding a doll in his right hand moving it back and forth with the head in his hand. He gave it a toss on the floor, but at no time did he look at the doll. The cabinet top was a slick formics and Kent began to slide around on the top, pulling his body from one side to the other using the hand opposite the direction in which he was sliding. Kent then slid off the cabinet and walked over to the juice table and lay all spread out on the top, remained there for a few seconds.

He walked back to the black cupboard again, and lay down on top. He slid off and walked by the observer moving toward the toy cupboard. As he walked past the observer, he gave her a quick look and with his hand pushed against the pad of paper in her hand. Kent again sat down on the floor by the toy cupboard and using his right hand, pulled about a dozen plastic stacking blocks from the container on the shelf. The stacking blocks were white and red and he pulled both colors from the container. As Kent pulled the white and red blocks out from the container, he put all the white ones in one place and all the red ones in another place. Then using both hands he put the red ones on top of the white blocks. As he stacked them, he positioned the blocks in a long line, the blocks were rectangular and these were lined up with sides matching. When the blocks were stacked and lined in front of him, Kent using his right hand rubbed back and forth several times across the top of the blocks which had rough indentations for stacking the blocks. As he rubbed his hands back and forth, his eyes were toward MB who was singing to a child. It was not possible to hear whether or not Kent was making any singing sounds along with her. Kent then again looked at the blocks; using his left hand he gently pushed against the sides of the blocks nearest him, apparently to straighten them. He had twelve or fourteen of these stacked blocks in a row.

Kent then stood up and walked past the observer. Then with direct eye contact as he approached the observer and walked past her, he was smiling. The observer had not smiled first. Kent continued the eye contact during the smiling.

Kent walked to a table where Mark and Tina were playing with a wooden truck and some stop signs. Kent reached toward Mark's toy. Tina put her hand on top of the toy, looked at Kent and said, "No, that's Mark' Kent looked at Tina, said nothing and walked away from the table back to the boy cupboard. Kent then began to make some kind of sounds. It was not possible for the observer to identify any of these sounds, however. Kent lay down on top of the toy cupboard and began to make what could be called "whimpering sounds." He was spread out on his stomach with his hands down on his sides. After a few seconds he walked over to the table and lay across the table in the same position. (CF)

(64) 10/67 Direct observation: A free-play session with many activities going on in the room. Kent was standing beside a tower of plastic stackin

blocks which were alternately stacked red and white to about 5/8ths of his height. He had evidently built the tower, but when the observation began, he was tapping the top of his tower with his right hand. The top was rough, indented surface of the blocks. As he tapped he stuck out his tongue and then moved over to a cabinet. He knelt down on his knees with just the top of his head and fingers visible. He began to tape the top of the counter. Kent then looked over the cabinet at the observers and smiled. Gresham walked over to Kent and hit him with a doubled fist about three times on top of the head. Kent didn't look at him, but got up then from his kneeling position, vocalized and smiled. Kent walked over to where the two observers were sitting and using both his hands began to pull on the beads around CF's neck. When Gerald also walked over to the observers Kent stepped away from Gerald and took off his sweater. Holding his sweater, he extended his arms toward MJ who took the sweater. (CF, PP)

(65) 10/67 Direct observation. Musical group activity was in session when the observer entered the room. A marching record was being played on the record player and several children were using various musical instruments in a small circle. The children with MJ and AS in the circle were Les, Karen, Dorothy and Tina. Gerald was on the rocking elephant, Mark was playing with a train on a table in a far corner of the room.

As the observation b egan Kent was walking round and round a cupboard in the center of the room. Although the record was quite rhythmic his movements didn't particularly coincide with the rhythm of the record. After several circles, Kent walked near AS who was sitting in the circle with the children. She was tapping two sticks to the musical time and she leaned toward him as he passed near her. Kent hesitated a moment and then stopped beside her. AS extended her hands, holding the sticks toward him and Kent reached with both hands for the stick. He stuck out his index finger of his right hand and slowly put it between the two sticks. AS held them quietly and Kent then reached for both of them, holding one in each hand, he tapped them together a few times in rhythm to the record and smiled. Kent took a few steps to the cupboard nearby lay one stick down and tapped it with the other stick.

Carrying the stick in each hand Kent then walked to the door and stepped up on the heating duct which runs along the floor. He stepped on it and stretched his body as far as he could to reach the light switch. With his right hand he flipped on the switch and smiled. As he walked across the room he looked up at the fixture and continued to smile. He then climbed up on a cupboard still holding the sticks and began to "la-la-la" in rhythm to the record. His tones went up and down as the record went up and down.

The door then opened and Tina's mother entered. As the door remained open for a few minutes, Kent walked toward the door and started out. MJ moved toward him and took hold of his hand and began marching with him around the table, singing to the record. She used a rather vigorous step and Kent walked right along with her as they circled the table several times. Then Kent pulled away from her with little effort and walked behind the open door and was out of sight for several minutes. (CF)

(66) 10/67 Direct observation: A free play period with many activities in process and several adults in the room, some visitors. As the observation began, Kent was looking around the room. MJ placed the plastic graduated cylinders in front of him on the counter. Kent moved his hand back and forth on it a few times and then walked away to the playhouse in the corner of the room. The door was standing partially open and Kent began to swing it back and forth using his doubled fist to move it. Kent then walked over to the toy cupboard and took a red screw type toy from the shelf and carried it over to a nearby counter set it down and repeated the rubbing motion back and forth with his hand. While he was doing this, Kent had -ooked in the direction of JK, the other observer. His eyes remained on JK while he walked toward him and Kent first stood on JK's foot and then moved up into his lap. He was smiling and singing under his breath the Doublemine gum sommercial song. His pitch was quite accurate. He remained in this position only a few minutes and then walked back to the toy cupboard. Mark was sitting on the floor in front of the cupboard and had already constructed a tower of the red and white stacking blocks. Kent walked around him and took several of the pkastic blocks from the shelf, set them on the floor and then assumed a spread-leg position on the floor. During this time he continued to sing the same song, "la-la-la." Kent made a stack of about five blocks and then Mark walked over and added his blocks to the top of Kent's tower. Kent glanced at Mark, continued to sing and smiled. Kent then moved his body around to face the toy cupbaord. He took the gear toy off the shelf, but instead of positioning the round gears on the form-board, lined them up in a row in front of him. At this time, Mark knocked over the tower of stacking blocks. Kent immediately turned around, looked at the blocks on the floor and turned back to the gears. Using several of the stacking blocks that were already on the floor, Kent began to line them up in front of him, using only red blocks and including no white ones. (CF, JK)

(67) 10/67 Direct observation. As the observation began, Kent was standing beside a cabinet apparently chewing gum. He was pulling plastic and wooden blocks out of a plastic bin alternately using both of his hands. He pulled out several and then turned the bin upside-down so that the remaining blocks emptied on the counter. Several fell on the floor and Kent squatted down and used both of his hands to scoop them together. When he had gathered them in one spot, Kent walked to a corner where the wall and a storage cupboard met. There was a space behind the cupboard and Kent put his hand and arm behind the cupboard as far as he

could reach, and from the movement of his shoulder it appeared that he was moving his arm up and down. He then attempted to put his head behind the cupboard but it was not large enough so he stood for several moments with his head tightly pressed against the cupboard. Kent then jumped back with a smile on his face and ran to the door. He hit the door at a full run holding both hands up in front of him to catch the impact. He turned around still smiling. He then walked to a table and ran his hand several times across the puzzle and began to squeal. Kent then walked to the block cupboard and lay on the top of it with his left foot hanging down and moving his foot back and forth. His face was toward the window. Kent remained in this position for just a few moments, then slid off the cupboard and walked over to the toy cupboard. He sat down on the floor with his legs tucked back underneath his body and using both of his hands pulled the plastic graduated cups from the shelf. They had been stacked together on the shelf and Kent began to pull them apart turning them all upside-down. He changed his position so that one leg was straight out in front of his body and the left was bent back under his bottoms. Kent looked briefly at the observer and then glanced around the room.

During this time, AS and several of the children were singing and began to dance around the room. As the children moved close to Kent, he glanced up as they moved past him. His eyes again turned back to the inverted cups and he set one inside another. He then changed his position so that both legs were sticking out in front of his body and he put his thumb in one of the cups and moved it back and forth in a stirring motion.

Kent then began some singing sounds going up and down the scale. He then put his hands over his ears and closed his eyes and pulled his lips in tightly against his teeth. He pulled his hands away from his head and continued to sing. Though there was a great deal of activity going on in the room while Kent was sitting on the floor, he would glance around but didn't seem to focus on any particular area or person. Kent then turned around to face the shelf and from a puzzle comprized of geometric shapes, pulled out all of the pieces with his left hand and placed them on the floor. He positioned them so that each piece was touching another. After removing all of the puzzle pieces, and replacing none, Kent stood up and walked over to the door. (CF)

(68) 10/67 Direct observation. The bus had just arrived and the children were involved in getting settled in activities. Kent was seated on the floor by the manipulative toy cupbaord and had evidently lined up the plastic stacking blocks in a line of about fourteen on the floor. The white blocks had been placed on the bottom and the red blocks were consistently placed on the top.

When the observer sat down, Kent looked in her direction and smiled, then ran toward her giving a loud yell. He then ran to the block cupboard and lay down on top of it momentarily. He slid his body to the floor and walked past the spring-horse giving it a push with his hand as he did so which began the vigorous bouncing. Kent then returned to the stacking blocks and sat down on the floor, using the tune of "Skip to My Lou" for sounds of la, la, and um bah, he began to stack the blocks into a tower using all that had been in the long line of the floor. He used his left hand only for the building and stacked them with no hesitation and quite accurate placement. He leaned his body over so he could put his face flat on the floor apparently looking at the tower. Then he stood up and tapped the top of the blocks still continuing to la, la, la. He put a small blue plastic object in his mouth and appeared to be moving it around with his tongue, then walked to the observer and without pausing, pulled out her beads which had been tucked inside of her dress. He gave a firm tug and then walked over to a cupboard where a plate of sandwiches was sitting. He picked up one and took rather a large bite, set the sandwich back on the plate and walked back to the blocks. In just a moment he returned to the sandwich plate and by this time Gerald was there attempting to select a sandwich. Without looking at Geralf, Kent picked up a sandwich and Gerald immediately gave him a hard push. Kent moved back and frowned looking at Gerald. He them moved away with the sandwich in his hand. With the sandwich in his hand and occasionally taking bites Kent then galloped back and forth in the room from the toy cupboard to the door and back again. During this time, Karen was on the floor kicking and crying as a result of an episode with Mark. As Kent galloped by it sounded as if he emitted a laugh and then moved on past. He turned around and walked back to Karen, kneeled down on the floor and pushed his hand against her stomach. She stood up and moved away from him; he returned once again to his blocks and knocked down the tower. Then he began to line them up again on the floor, still with the white blocks on the bottom and the red ones on top. Kent picked up one of the white stacking blocks and placed it on top of several of the objects in the manipulative toy cupbaord, the plastic cylinders and gears particularly. He moved the white block back and forth, and up and down, as if attempting to fit it together as a stacking block. He then lay down on the floor and put his head on the line of blocks. (CF)

(69) 11/67 Direct observation. The children were already in the dining room eating as the observer entered. Kent was sitting on the bench beside the serving table, he was holding a sandwich in his right hand and there were several crusts beside him on the bench, one leg was tucked under his body and the other one was dangling down moving back and forth. He had a piece of cloth tied around his middle that was also tied to the arm of the bench so he couldn't move away. As the observation began, his eyes seemed to be off in space and this continued for several seconds. His body was quite still until Tim came into the room. JS said to Tim, "It is not quite time for you to eat yet." Kent's eyes moved to JS and Tim, his body immediately began to move and he began to smile.

JS suggested to MK that she get some jello for Kent in a bowl. MK with the bowl of jello sat right beside Kent on the bench and held it while he ate with a spoon. He took rather large bites, ate quickly with eyes continuously on the bowl, and with a very full mouth each time. The jello was soon gone. MK then asked JS if Kent could have more jello. When MK brought another bowl, he immediately began to eat once again with his right hand. While he was eating his left hand was in a tight little fist and was also moving back and forth as if to accompany his right hand. He dropped a little of the jello on the knee, and without comment from an adult, immediately used his spoon to scoop it up and eat it. He quickly ate all of the second bowl and while he was eating, he emitted some sounds from far back in his throat, very softly. When he was done with the second bowl, MK wiped his mouth off with a washcloth and during this time Kent made what might be described as whimpering sounds. MK, looking at Kent, said "It is cold, isn't it Kent?" When she finished cleaning his face, MK moved to the table. Kent picked up the crusts of bread from the bench beside him and began to sing softly. He took three bites at once from the curst before beginning to chew and during this time continued singing back in his throat. His leg moved back and forth, he put one hand on the binder around his waist but didn't seem to pull at it or strain against it. He did move around on the bench and pushed the rest of the crusts beside him on the floor and smiled as he did so. Then he put his finger in his mouth and made sounds like, "Wa-wa-wa." Then he began using the tune of "Skip to My Lou" making the sounds "Aga-waga." MK sat on the bench beside him with a cupful of milk and she held the cup close to him apparently waiting for him to reach for it. For several moments his eyes seemed to stare out of the room with a vacant look and his body was still. Suddenly he began to move his whole body and smiled and took the cup from her hand and had several swallows. The observer was not able to identify whether or not some activity in the room had altered his attention. JS walked by saying, "You're a sloppy Joe," and smiled as she picked up the crusts from the floor and put them back on the bench. In a few seconds Kent began to eat the crusts and took several bites. JS once again walked by and bent over him, patting his tummy saying "We should call you little trash can or at least some kind of _____." Kent smiled and flailed his arms and kicked his legs. (CF)

(70) 11?67 Direct observation: Free play period with three adults present in the room. As the observation began Kent was sitting flat on the floor with his back to the observer. He was in the position he frequently assumes with his legs spraddled out to the side of his body and feet tucked into his side. There was a tower of about fourteen stacking blocks in front of him which he had evidently piled. They were stacked with alternately red and white blocks. He was sitting with little motion and suddenly jumped up and gave a high cry. He ran over to the coat lockers and lay down on the bench momentarily, then sat up and pulled three or four coats from the hooks onto the floor. There

happened also to be two pairs of boots in the lockers, one pair red and the other white; he turned these over on their sides with the soles of the boots toward his body and stacked them alternately red and white. Sitting once again in his spraddle-leg position, he rubbed the soles for several minutes mostly using his index finger and tipping his head to the side as he rubbed his hand back and forth. He was smiling and humming the tun, "Skip to My Lou" under his breath. He then stood up and walked past the cupboard containing a plate of sandwiches, and as he walked by he picked one up, took a large bite out of the middle of it, set it down and walked away chewing. At this point MO was standing near the door and Kent using both of his hands pulled her hand toward the door. She looked at him and asked if he wanted to go to the bathroom, saying, "OK, Kent, just a moment.

They went upstairs then to the bathroom and the observer followed and when she arrived Kent was standing beside the toilet with his play suit and his underpants dropped around his knees. He stood there for a few moments and then walked to the door with a rather waddling motion, a bit encumbered by his clothing, then squatted down and began rubbing the floor with his hand. MO watched him for just a short time, then said, "Come on Kent let's try again." She picked him up and led him toward the stool, this time standing behind him with her body touching his so that he was unable to move away. Kent then leaved his body way forward so that it stretched across the stool and he put his head on the tank for a few seconds. MO then said, "OK Kent let's try again after a while," helped him pull his pants up, and they started down the stairs. Kent walked next to the bannister, holding on with his right hand and double stepped all the way down. As they went down the stairs MO used the tune "Skip to My Lou" for "la-la-la." As soon as they got to the bottom of the stairs, Kent started into the kitchen. As MO started after him he made a backward step seemingly to avoid her and started into the dining room. MO followed him and picked him up and carried him back into the boardroom. Back inside the boardroom again, Kent began to gallop around screaming and crying and sat down on the bench in front of the lockers. As he had been crying, Tine standing to one side, watched him with what appeared a rather distressed look on her face. She sat down beside him and put her arm around his shoulders, asking "What's the matter Kent?" He smiled and Tina then smiled and walked away. In just a few seconds he once again jumped up and began to scream two or three times. She, still standing nearby, looked at Kent for several seconds with the same apparently distressed look. Kent then sat down on the bench and pulled a jacket in front of his face. After a few moments he dropped the jacket and sat quite still gazing around the room. (CF)

(71) 11/67 Direct Observation. The children had just entered the room after the arrival of the bus. Kent was sitting in the lockers with his body tucked back inside the cubbyhole and his seat stretched out along

the bench. He was chewing quite vigorously on the cord of a jacket which was not his. He pulled occasionally at the cord with his right hand while he was chewing. Every few moments he would emit a kind of cry. Kent then stood up and opened the door of the playhouse next to the locker area and pushed the door wide open and then sat back down. He then carried the jacket into the play house with him, continuing to chew on the cord. Tina followed him in and pulled the jacket from him. Kent immediately came out of the playhouse, giving several cries, there were no apparent tears and walked away to the locker area where he immediately pulled another jacket which had a simpler tie cord from the hook and began chewing on the cord immediately. MK at this point, took Kent's hand saying, "Let's go to the bathroom," and they left the room.

Note: While Kent was sitting in the locker area, immediately after his arrival JS walked up to him holding a new punching bag near his body and he pushed it away with considerable force and turned his face away from it.

(72) 10:10 a.m. (Kent just returning from the bathroom.) As he entered the room he was crying and there were tears running down his cheeks. He jumped up in the air and threw his head back as he came back down to the floor. He repeated this two or three times. MK then said, "Here it is Kent," and carried a plate containing toast to him, holding it directly in front of him. Kent neither looked at the plate, nor reached for it, but stood quite motionless for several moments. At this point Karen started crying quite vigorously. Very quickly Kent also began to cry vigorously but it was not possible to determine whether or not Karen's crying was the occasion for Kent's crying. While he was crying, he jumped in the air and then walked to the door, and pushed his body against it hard. MJ came to the door, opened it and again walked out of the room with Kent.

10:15 a.m. (Dining room) As the observer entered the dining room, Kent was sitting by himself at one of the tables. MJ was the only other person in the room and she was sitting on a bench. Kent was using his right hand to pull his lower lip out and down on his chin. Every few moments he would give a kind of a whimper. There was a glass of chocolate milk sitting on another table. There was no verbal exchange whatever between MJ and Kent. She did comment to me after I had entered that Kent had a cold today and there was considerable congestion in his chest.

10:20 a.m. Kent walked over to the table where the cup was placed. As he reached for the cup, MJ moved toward him a bit and he immediately pulled back with a smile. She then sat back down and he moved to the cup, picking it up with both hands and took two or three swallows. Kent then held the cup in his right hand and pulled his arm way back behind his shoulder and threw the milk in the direction of MJ.

(73) Since there was considerable milk still in the cup, there was enough liquid to liberally cover MJ and the wall. Kent smiled and very quickly moved his arm back again as if to throw the cup. MJ very rapidly moved toward him and took the cup from him saying, "I was pretty sure you were going to do that." Kent smiled.

At this point JS entered the dining room and commented that it might be interesting to see whatkinds of behavior would follow with Kent alone with her in the therapy room.

10:30 (Location: therapy room with JS and Kent) After Kent had entered the therapy room with JS, he was singing and smiling. JS had set up two chairs at a table and called to Kent, "You sit here." He had been quite actively exploring the room, going over to the window, pulling at the loose edge of a large roll of paper that was sitting against the wall, and also looked down the opening in the center of the paper roller. JS then held Kent's hand and moved him to where the chairs were placed. Kent continued to smile as JS helped him sit down in one of the chairs. She had placed a box of small building blocks about two inches in diameter on the table. As she put one in front of Kent she said, "You take one and I'll take one and we'll put them together." She took four or five more out of the box and set them on the table. He put the sides of three or four together so there was a line of blocks directly in front of him, and running parallel to the edge of the table. JS then suggested, "You put one on the top." She stacked the blocks in front of her which were about four into a tower. She was working fairly close to Kent so that he could easily see what she was doing and how she was manipulating the blocks. Using his right hand, he took her stack of blocks down and put them in a line. JS then put two parallel lines of blocks in front of Kent and handed him another block. Kent then pulled the blocks from the line farthest away from him and combined (74) them with the blocks already in front of him to make one long line. JS constructed another line of blocks extending it at a 45-degree angle behind Kent's line of blocks. Kent immediately added these to his line of blocks which made it number about fourteen. JS then moved the blocks into three separate lines, all parallel, and placed more blocks in a random position on the table close to the three parallel lines. Kent immediately pulled the blocks from the line farthest from him and stacked them on top of the blocks in the front line, so that he had a tower of two blocks. He then stacked two of these towers together so that he mad two stacks of four blocks each. JS immediately said that was very good. Kent brushed the twoers with his body and they fell down. Some of them went tumbling to the floor, he pulled a chair back from the table and started looking on the floor.

10:35 a.m. There were five blocks in a line in front of Kent. Once again, they were parallel to the edge of the table. JS placed one block in back of the line and handed Kent another. He added it to the

line of blocks and JS commented that all of the red sides were toward his body. As JS looked in the cupboard for additional equipment, she held Kent's hand who continued to sit in his chair at the table. JS then made two rows of blocks which were touching, but didn't complete the building at the end toward Kent so that several blocks were placed close to the rows but were not in order. She then placed a small car on the top of the rows of blocks. At this point, Kent had walked to the other side of the table and had found a bag of marshmallows, holding the sack and smiling. JS took one from the bag and put it on the top of the car which Kent picked up immediately and popped in his mouth, smiling as he did so. JS then commented to Kent, "Let's finish the road." He circled the table and looked toward where he had found the bag of
(75) marshmallows. JS was holding them, held the bag up saying, "Yes they're here," and then she tucked them back down in her lap. She then very quickly showed Kent a marshmallow that she held in the palm of her hand and then closed her fingers again. He reached for it, but she pulled her hands back and moved the hand holding the marshmallow toward the partially completed length of blocks. He then placed a small block on top of the blocks and moved two blocks quite close to the end of the two lines. JS then handed Kent a block and very quickly showed the marshmallow piece that she held in her hand. He put the two blocks together and almost touching the lines already constructed. JS immediately gave him the marshmallow piece. JS then stacked four blocks, two blocks high, saying to Kent, "Here there are two more." She handed him a block and he stacked two together and pushed them against the stack she had already built. In a singing voice she said, "That was very good, very good," and gave him a marshmallow.

10:40 a.m. Kent had crawled underneath the table and JS sat down in the chair holding the marshmallows on her lap so that Kent would see them. He immediately came from under the table and she pulling his arm sat him in a chair. There was a paper placed on the table with two crayons on it. Kent stood up and JS showed him the marshmallow. He reached for it and she closed her hand around it and pulled it away. JS drew a circle on the paper saying, "Round and round and round we go," several times. Kent walked around the table and then around the room, then returning to the table walking close by and picked up a crayon and made a very heavy line on the paper so it was evident that he was using considerable pressure. He smiled as he drew on the paper. JS then said, "I'll help you," and placed her hand around his which was holding the crayon. The crayon kept slipping out so it appeared Kent was exerting very little pressure to hold the crayon. JS helping to
(76) hold it in position continued to lightly hold his hands as he was standing beside the table and began to move his arm round and round and repeating the song, "Round and round we go." Kent began to move his body back and forth in rhythm to the song and smiled.

10:45 a.m. JS had placed a marshmallow inside the control cupboard which doors are operated by remote control buttons. There were two marshmallows placed behind the glass cupboard doors. Kent stood directly in front of the cupboard and used his fingers to attempt to pry the door open. He then pulled JS's hand to the cupboard door and pushed it against the door and moving it back and forth as if he used her fingers for prying. As Kent pulled on JS's hand she would say, "Marshmallow, marshmallow," and "Open, open." This was repeated and at the point that Kent made a sound, JS opened the door and got the marshmallow and he immediately popped it into his mouth. Kent walked around the room touching the wall, the paper roll, and the cupboards as he was chewing the marshmallow and then returned to the cupboard. Once again he picked at the door with his fingers and pushed JS's hand against the door. This time he looked behind her, but wasn't possible to determine whether he was looking for marshmallows or looking for the control box. As he walked away he said, "De, de, de," and JS opened the door. Once again he reached for the marshmallow and popped it into his mouth.

10:47 a.m. Kent walked away from the control box and was playing with an extension cord at the other side of the room. JS snapped the door open and at the noise Kent turned his head toward the cupboard and walked back. Very soon after he returned to the cupboard he verbalized and once again JS opened the door and he had another marshmallow piece. There were once again two marshmallows placed behind the glass (77) covered door. Kent was standing a bit distant from the cupboard and JS said, "Open, open," very slowly and distinctly and opened the door and took the marshmallow out, held it in her hand a moment, and then ate it. Kent pulled her hand toward the cupbaord and made what might be termed, whimpering noises, and she said, "You say it, open." He again pulled on her hand toward the door and then walked away from the cupboard, returned in a few moments to again pull her hand toward the cupboard door. This time she said, "la, la, la." He walked to the table and leaned over and tapped the edge of it several times, then returned to the cupboard and pulled her hand toward the cupboard door. (CF)

(78) 11/67. Direct observation. This was the children's first day back at Linwood after the Thanksgiving vacation. Kent was placing a stacking block on the top of a tall tower of about fourteen blocks that he had evidently been building. The blocks were once again stacked alternately red and white. Kent walked away from the tower after a brief glance at it and stood for a few moments beside the rocking horse looking around the room. He then ran to the door smiling and giggling. He ran into the door with some force, turned around, ran back to the horse, then repeated running to the door and back again. During this time the smile remained on his face and then he walked to the locker area, pulled a hat from one of the hooks and put it in his mouth and began chewing rather vigorously. As he chewed he evidently held it tightly

in his teeth for he didn't use his hands. Kent then walked into the playhouse and walked out in just a few moments carrying a purse. He was holding it in both of his hands and swung it back and forth. He walked across the room and dropped the hat from his teeth, but continued to carry the purse. At this point, Kent walked back to the tower he had been building as the observation began, picked it up with both hands after placing the purse on the floor. He began to smile and walked toward the observer and sat directly at her feet and began to separate the stacked blocks. Kent then made six piles of two blocks (a red one and a white one) with the white consistently on the bottom and the red on the top, the sides were touching and they were placed in a long line in front of Kent's body. He looked up at the observer, smiling and after (79) brief eye contact stood up and galloped around the room in a complete circle, smiling. He returned to the blocks that had been placed at the observer's feet and squatted on the floor with the usual position of his feet spread out to the side and once again began separating the blocks, this time putting the white one on top. After completing this with all of the blocks, he once more separated them returning the red to the position on top. He then again reversed this position placing the white ones on top. In the separating process he held the bottom one with his right hand removing the top one with his left and consistently began at the left side of the lien of blocks and moved to the right. As he wold restack each one he would give it a rather hard push on top as if to make certain the blocks were stacked securely. Once again Kent reversed the colors, then put his hand on top of the blocks and rested his head on top of his hands lying prone on the floor. While he was lying on the floor he stacked all of the blocks again into a tower. He used only his right hand, but the fingers of his left hand were working back and forth as he built the tower.

10:40 a.m. At this point the observer built two small stakcs of blocks; there was a red one on the bottom of each. This was purposely done to see how Kent would behave in stacking these two small towers which would place two red blocks together. Kent picked up one of the short stacks of blocks and did place it on the top. He looked intently where the two red blocks were together instead of the usual pattern of his alternate red and white, picked up the top stack and turned it around, replaced it, and once again looked at it intently. Of course, the two red blocks were still together. Kent then picked up the stack and turned it upside-down, but there were no indentations to match and so this would not hold He then took the bottom red block off which made possible alternate red and white. He patted the tower and smiled.

(80) 10:50 a.m. Kent was galloping around the room again making a "Ya, ya, ya" sound. There was no recognizable tune but he was smiling. He ran to the observer picked up her hand and tapped it quite vigorously several times with his fingers, continuing to smile and emit the 'ya, ya,

ya" sound as he did so. He then galloped over to MO repeating the same tapping process and then walked over to AS once again using the same hand tapping.

10:55 a.m. As Kent was standing beside AS she put a Montessori form board on the table directly in front of Kent. As she did so, she commented, "Here Kent, sit down," and putting her hands on both of his shoulders used a slight pressure to put him in a chair, but Kent did stay there without attempting to move away. He immediately took all of the pieces out of the form board. There were three sets of geometric shapes, circles, triangles, and squares; each set a different color and each set containing four varied sizes of each shape. While Kent was removing the pieces there was no comment from Anna to him though she was watching him intently. After he had removed them all, Anna commented, "Kent, let's put them back," and Kent immediately began to replace the pieces. He replaced the circles first and put each shape in the correct form with no experimenting necessary. He then began to replace the triangles; first attempting to put them in the square forms and then trying to put the largest triangle in the smaller form, then sliding the triangle down until it fell into the correct-sized form. After he had replaced all of the triangle shapes, Kent stood up and AS immediately touched his shoulder and said, "Let's put this back and then you can go
(81) Kent." Kent picked up one of the squares and as he began to replace it, AS sang, "la, la, la" to the tune of "Pop Goes the Weasel" very softly. He looked at her and smiled. At this point, he slid to the floor from the chair, she picked him up saying, "Let's finish it." She placed her body very close to his so he could not move away and he immediately put back all four of the squares. As soon as he had succeeded in replacing the forms, AS said, "OK very good, you can go Kent," and she stepped back from him. Kent smiled and galloped away.

11:00 a.m. JS had entered the room and had been observing the children for several minutes. Kent came galloping by holding a long piece of paper ribbon. JS took hold of one end of the ribbon and began to move it back and forth so the ribbon turned over as a jumping rope. As the ribbon turned around, she sang, "Round and round we go." Kent smiled. As he continued to hold one end of the ribbon, he began to spin his body around, smiling as he did so and squealing. She continued to sing the song, and after he had made three or four revolutions he dropped the ribbon and walked away. JS followed him, placed the ribbon again in his hand, lightly holding his fingers, and rucking them around the ribbon saying, "Hold on once more Kent." He immediately gripped the ribbon and she removed her hand. He then started turning his body in a rotation and he continued doing it three or four times. JS said, "OK that's very good Kent," and he dropped the ribbon and walked away. (CF)

(82) 12/67. Direct observation. The children from the toddlers' room were in the dining room for lunch. Kent was sitting on the bench near the serving table with the sheet tied around the waist so he could not

move away. He was eating a jelly sandwich holding it in his left hand and taking bites in a rather rapid sequence continuing to hold the sandwich very close to his face. When only the crust remained Kent emitted a high squeal and JS standing nearby turned to Kent stating, "What is darling" and immediately handed him another sandwich. He set the remaining crust on the bench beside him and began to take bites out of the fresh sandwich. After a few bites Kent screwed up his face, tensed his body, holding his legs out straight in front of him and his arms out to the sides of his body and gave a cry. JS immediately asked Kent if he wanted a sandwich for the other hand. She held one near her, holding her hand open and he pushed her arm away. He then began to take quite rapid bites from the sandwich he was already holding, swinging his legs back and forth as he chewed. His feet were not able to touch the floor because of the height of the bench JS then asked Kent if he wanted some soup and held the dish near him. He squealed, kicked his legs and smiled, and reached for the bowl with his right hand. JS helped position his left hand underneath the bowl for support and Kent held it about chest high, pushing one edge of the bowl against his chest. He held the spoon with his right hand and began taking bites in very rapid succession with his eyes looking down into the dish continually. Gerald walked nearby and Kent extended his hand holding the soup (83) bowl toward Gerald. Because of the angle at which Kent was holding he bowl some of the soup spilled on the floor. JS walked over immediately and took the bowl from Kent's hand so it was not possible to observe whether he was contemplating throwing it at Gerald or what the following behavior might have been.

11:45 a.m. Ken finished a bowl of fruit cocktail and still holding the bowl in his right hand used his left hand to pull on the binder around his waist. It came off immediately and he stepped off the bench, walked over to the serving table and reached for the bowl containing fruit cocktail. AS moved quickly beside Kent asking, "If you want more, sit down and I'll bring it to you." He complied immediately, returning to the bench, sitting down, and the binder was not retied around his middle. Kent held the bowl while AS filled it. He ate very quickly, once again his eyes directed in the bowl. He filled the spoon very full with each bite and rarely spilled any of the food as he lifted the spoon to his mouth. (CF)

(84) 1/68 Direct Observation. During the observation Kent was sitting on the floor stacking the plastic blocks, four high, a red one, two white ones, and a red on top. In observing also in taking with AS Kent seems to be building more complex structures. For example he recently built with the blocks by placing two a small distance apart on the floor and using a third block to connect the two and serve as a bridge. Kent now has in his building-block repertoire several patterns which are consistent but which he will use alternately during one block-building period. For example, he will build a tower of single blocks twelve or fourteen

blocks high, alternately red and white blocks. Another pattern is two or four blocks high along the floor in a long connecting line of blocks. Kent doesn't seem to proceed through a particular sequence or a chain of patterns in his building play.

While building with the blocks, Kent again exhibited the frequent pattern he uses in his activity. He will concentrate for a period of four or five minutes on the activity, then remain seated near the activity and begin to look off in space or around the room for a while, and then will spend a period of time wandering, walking around the room not being involved with any materials, equipment or any particular people.

During this observation Kent did smile a couple of times in observing an activity of another child such as Dorothy rolling cylinders across the floor. He didn't, however, become involved in the activity any more than observing. (CF)

(85) 1/68 Direct observation. Kent still continued to be tied to the bench beside the serving table. During this observation he did stand up several times and tried to use both hands to scoot the band off his body. He didn't, however, cry or particularly struggle with it and when AS would have him sit back down he would comply fairly quickly.

During lunch time Kent made several verbal sounds. One was "E-i-ei-e-i several times, he also used "La, la, la."

When he had finished eating and was still sitting at the bench, he was using the sounds, "La, la" to the tune of "Skip to My Lou" and smiling. He put his hands over his eyes and turned his head back and forth. AS then walked very close to Kent and put her head in front of his face and smiling saying, "La, la, la" to the same tune. Kent's eyes were focused directly on As's and he smiled and reached toward her with both of his hands and patted her face. (CF)

(86) 1/68. Interview with therapist. Kent does not go immediately to the stack blocks as he originally did--plays with more different toys--the Play Skool truck, played briefly with the beads and one of the simple puzzles. Most of the time he spends wandering around the room in circles, humming and I on Thursday (1/25) noticed that he did this the entire morning and nearly all day, he hardly engaged in any other activity at all. He hums several tunes--I detected "Merrily we Roll Along."

He seldom takes part in any activity at the table--stays very much alone. He looks pleased and satisfied most of the time--seldom cries.

On Monday (1/22) MO got him to rest for the first time--he seemed quite relaxed. He rested again on Thursday, briefly. He stacks his blocks in different patterns now, not always the same. (KF)

(87) 2/68 Interview with Therapist

CF: Can you describe what you remember about Kent when you first came to Linwood which was in May 1967, right? OK why don't you just go ahead and comment on what you remember about him then.

AS: Well, way back in May 1967 when I first came I remember Kent as being very quiet and he was still mostly just sitting in a corner very inactive. Every time it seemed that I approached him he would just run around and flee to get away from me or people in general. I'd say during the summer he came out a little bit more, you could see a gradual progression. We had arts and crafts and he would go down and he really participated in the activities that were down there. Then it seems like there was another big step when he was very whiney and crying, and you didn't know really what was causing it. He would just scream and really have a fit, and now he has changed again, he seems very happy. There isn't too much crying without a cause that we can see and he seems to be showing more interest in people--his eye contact is very good now, he has picked up a lot of little songs that he hums and I'd say in general he is a lot happier than he was in May when I first came.

CF: Do you remember what he was like with people then? Was he affectionate, would he come toward you, if you tried to touch him or pick him up, or did he pull away from you?

AS: For the most part, I would say he pulled away from people.

CF: If you tried to approach him, he would withdraw?

AS: Yes. The only thing he did like and which he likes even more now is rough-housing. I can remember JS coming in and swinging him and there used to be this little song, "Hello, hello," somebody would take his hands and somebody would take his feet, and really a lot can be done with this, I think, because he really likes it.

(88) CR: What kinds of behavior? What kinds of things do you remember that he did the most? When you first came, if you were to just give a little word picture of what Kent did during the day, what would your major impressions be?

AS: Then it would have been inactivity.

CF: Just sitting?

AS: In a corner or moving from corner to corner, and now he walks around a great deal, he involves himself in like his block building, and he'll really stick with that for a long time.

CF: That's another question you might comment on. What kind of activity, you said at first he just sat, did he use any type of toys or materials at all? Do you remember?

AS: No. I can just remember him sitting and that was all.

CF: What kind of materials, you mentioned the blocks, you might describe what he does with the blocks and is there any other kind of equipment that he uses?

AS: Well, the blocks are interlocking blocks, they are plastic and they really make a lot of noise. He can stack them, I don't know in how many different ways, he really does a lot with them. He rotates the colors and just the other day--he is something about matching colors--we had the rugs out for a rest time, we had these two trains (one is green and the other orange) he went over and got these two trains out of the cabinet and I turned around and they were matched correctly on the rugs--we have a green rug and an orange rug; if we have little plastic toys he will take them out and divides the colors a lot and he particularly now is interested in puzzles, but he takes those out and he does a lot of that, and he tries to be contrary, like it won't go in and then he comes over and he takes me by the hand; I was on the other side of the table, he pulls me around and brings me over to match the puzzle. It seems like, I mean he comes to you now and he wants you to do things. He'll take your hand and take you to the cabinet, if he wants something. He is doing a lot more of contact with people.

CF: You mentioned the other day something about that he seems to be more aware of activities that other children are engaged in, and though he doesn't join them, afterwards when the activity is completed he may go.

AS: That was with exercises.

CF: With the exercises and something about clothes pins in a bottle.

AS: We were dropping pins in a bottle.

CF: Yes, do you want to describe that again?

AS: Well, after three o'clock I had the three girls and we were playing. I brought clothes pins in from home and I had this little container and they would sit up on the desk and drop the clothes pins in. This was going on, they were taking turns and then after that we left it. I just left the clothes pins and the bucket on the table and I turned around and Kent was over there doing the same thing and then I went over and tried it with him and he was dropping them in.

CF: What about exercises, you referred to this too?

AS: There too, that is a group activity and while it is going on I really concentrate on the ones who are doing it and some of the other staff occasionally may bring some of the other children in who were on the sidelines. But then after that is over too, it sort is rough-housing, and as I say I think Kent likes this and enjoys it. He will come over for his little flip after everybody has had a turn also. Then I told you about the walk. We were on a walk.

(90) CF: Describe that again.

AS: Well I wanted to see who was really holding whose hand; was Kent holding my hand or was I holding Kent's. It used to be I used to have to hold onto him and I would hold him by the wirst and we were holding hands and I let go to see who was holding who, and it was Kent holding my hand. He is very good about walking now, he is one of the easiest ones to take.

CF: He doesn't run away?

AS: No, he holds your hand.

CF: He used to run off? If you didn't control him?

AS: You'd be chasing him all the time. Now he holds your hand and walks very good.

CF: Well, what about his crying behavior? Do you remember any patterns of this? Wait, let me broaden it a bit and just ask about his verbal behavior or his use of sounds, has this increased in frequency at all or do the sounds change?

AS: Well, the frequency in sounds has changed and they are really--there is more a variety of sounds. I like to hear it more than once, but I played with him to pick him up, sometimes I'll say "Up." I have heard it, I'd like to hear it more to make sure I heard it right, but it really sounds like he is saying up and as I said his little repertoire of songs has increased tremendously. I told you that one morning it was just he and one of the other children in the room and I was humming a song that one morning and he picked it up just like that.

CF: He seems to be very accurate in his tune, when he duplicates a song he does it quite accurately.

(91) AS: I can identify what he is humming. The crying in general... two months now, well prior to that he was doing a lot of crying and really a bit aggressive on...

CF: Was this a change, this aggression?

AS: ..now, he is happier in general, that would be a general comment that his crying has decreased. He is still a bit aggressive, I don't know why.

CF: Has he always been aggressive?

AS: If you go back to May, no.

CF: So, he was very passive because you mentioned that he just sat all day. And then, at some point, he began to be aggressive.

AS: Biting, pulling, pinching, and he will go around tapping other children. This was funny yesterday too, we were on a walk and I had on my leather gloves and he kept feeling them and then he put them up and rubbed them against his cheek. Usually he will come over and he will pull your skin or pinch you, and I usually go "Ouch!" and he was doing it yesterday and looking right in my face and grinning, and I wasn't making any sound and I just said, "Ha, ha, I have my gloves on."

CF: When it has come is it because a child has done something to him, or...

AS: Nothing brought it on.

CF: He just.. What does he do if a child is aversive to him?

AS: He knows who to watch out for. If they come near him and if he sees them, then he will go, he really takes off.

CF: Does he ever...or does he flee?

AS: No, I would say flee, and his aggression isn't to get back like if someone hits him

(92) CF: Are there demands made of Kent now? Are there any kinds of things that you do for him or with him that are contingent upon some kind...

AS: The main thing I can think of is speaking. He wants...and I try to get him to say the word, up. ...He is very negative when it comes to work and prior to this time when he was in residence, this is another thing. If you would sit down and really make Kent work he would get very upset and cry and scream afterwards.

(93) 2/68 When Kent first came to Linwood he was a very very passive child even when attacked by another child he would react in no way. Currently as observed on February 26, 1968, Kent would frequently go either to adults or children and scratch or pinch it hit them on the head. There was no apparent provocation. According to AS, however, he does not strike back in reaction to another child attacking him.

During the observation this morning singing very accurately in terms of both tune and sounds a song that one of the staff members frequently uses, the sounds which Kent made were Hey, la-de, la-de-la-la, hey, la-de, la-de-do." (CF)

(94) Interview with Jeanne Simons, 3/68. We took him in residence and he had developed some aggression with a transition. Even when he had been admitted to Linwood as a Day care child, the separation from his parents had been easy. When he did come in residence, he would eat whatever we would give him. He did the same with food that he did with people. He would take it on his own terms. He may eat raisin bread or peanut butter or chocolate milk for a long time and it is almost impossible to get anything else into him and we haven't tried very hard.

I think we should say something which can also be found on the video tape. He quickly responded to humming. His first vocaliation was perfect humming. Whatever sound he would choose--la, la, la or anything. But he would practically do this day and night, over and over again. We have been able to give him different songs.

We cannot say this child talks, but with his speech--I have heard him repeat jello when I gave him some--he can go la, la, very well. So he liked jello at that time and he said jello after me. When he sings "Mary had a Little Lamb," he will give you "little lamb," but you have to listen very carefully because it sounds as if it has ten l's. So he gives it to you and looks at you as if it is kind of a game. It is kind of negative, but it is definitely "little lamb." Even on the video tape you can see that he has been able to say "hello"-- l's are very easy for him.

He has been almost completely toilet trained. He wasn't trained when he came to Linwood. He may wet himself once in a while.

Sleeping is pretty difficult. He's usually up half of the night. We have no explanation for that. Again we go back to that there may be some organic difficulty, but it's not up to us to find out. He is very gay and sings through the night.

He is taking a little medication during the day, to ease him down. He's very difficult during the night. We had him caping, and he sang through the night repeating one song over and over again in a loud voice. But he's a very happy child at night, but keeps everyone awake.

Chapter 8
Appendix

Kent likes to move his hands over rough surfaces. He seems to prefer rough surfaces that have a pattern or rhythm in them. Such as corrugated paper or sand running through his hands. Things such as play dough he will crumble into fine crumbs. He will make intricate patterns with the stacking blocks. There is also a pattern in what he builds. It is kind of artistic.

3/68 - Direct Observation: AS had commented to me that she had noticed some new behavior in Kent recently. He would place his face very close to hers and what seemed to her explore and experiment with her face by patting her cheeks and putting her face against his. The following is an illustration of what AS was describing.

(95) As the observation began AS was on her knees on the floor in front of Kent positioned very close and looking directly at his face and singing softly. Kent was also looking at AS and it was not a blank gaze but appeared as if he really was focused and studying her. (96) AS moved close to him swinging her body forward from her knees and after just a moment Kent pushed her away. This was repeated two or three times. Kent continued to look at AS. AS continued to sing and Kent began to sing also. He would duplicate and repeat the song that she was singing and then began to "La, la" to a completely different song which he did quite accurately. AS changed her approach to Kent a bit by moving her body toward him and then immediately moving back and repeating this three or four times. Kent began to laugh and reached toward her with both of his arms which when AS was close to him he put around her neck and seemed to pull her body toward him. He placed his face close to hers continuing to smile and put his head against AS's cheek and his mouth against her face a bit opened as if to perhaps imitate a kiss. Kent then pulled his head back a bit and placed both of his hands on AS's cheeks and patted them very gently. While he was doing this his eyes were directly on her eyes and he was smiling. Kent again pulled AS toward him and cuddled his face against hers for a few moments. This whole episode probably took about eight minutes.

At this point AS said, "Come on Kent, let's get some play dough," and she reached for Kent's hand. He resisted pulling it away and she replied, "If you don't want to come, OK, you may stay here by the window." AS then walked over to the cupboard and returned with some (97) play dough which she put on the table. Kent continued to remain on the cover by the window for a few minutes and then began to cry quite vigorously with tears. It was not possible to ascertain whether this was because AS had left or not. There was no other apparent cause.

(98) 3/68 - Direct Observation: JS and three or four of the staff members were working with several children in the hallway during the lunch hour at a group game. Two were used while "Farmer in the Dell" and "Here we go round the Mulberry Bush." The group had joined hands

and were circling and singing. JS reached out and pulled Kent into the circle while they were in motion. He made two or three rounds with the group then pulled out of it. He watched for a few moments and then voluntarily came close to the circle and reached out to JS as if to rejoin the activity. She again pulled him into the circle and he moved with the children in a circle. (CF)

(99) 3/68 - AS feels that Kent is controlled by the string which he frequently carries with him. She observes that when he has the string his only behavior is to chew on it or play with it with his fingers and he does little else. When AS puts his string away he has much greater variety of behavior. He will run around the room; play with blocks; or become involved in other kinds of equipment. (AS)

(100) 3/68 Direct Observation. Karen has recently begun to tease all of the children in the board room. With a smile on her face she will approach them, put her face very close to them and then begin to pull on their arms or poke their bodies. During the observation Karen moved very close to Kent, putting her nose practically against his, smiling and then pulled gently on his arm. Kent quite quickly pushed her away with a vigorous shove, and then he walked over to another child and gave him a hard push.

This was the first time the observer had seen Kent immediately retaliate toward some kind of behavior which he found aversive. (CF)

(101) 3/68 Direct Observation. Some toys were spread out on one of the tables which were composed of four different types of pieces. One was a plastic strip which had holes in it and another was nuts and there were also some bolts and some small blocks, all of which could be screwed together. There was also a small plastic screwdriver for tightening the bolts. Some child or adult had already assembled several pieces which were strewn around the table. Kent walked to the table and sat down, but there were no other children or adults nearby. He first stacked several of the blocks into a tower of four or five blocks. He then began to dismantle some of the assembled pieces of the strips and the nuts and the bolts. He held the plastic strip in his left hand and used a very effective and rapid screwing motion to disassemble the pieces. He succeeded in taking three or four apart, then picked up one which had been rather tightly assembled. When he turned this one the bolt turned as well as the strip and so he was not making any progress. He continued at this piece quite consistently for a minute or two. Then the observer moved her hand forward to help him hold the bolt, and Kent immediately pushed her hand away. AS then attempted to help Kent, and he also pushed her hand away, still continuing to attempt to unscrew the toy.

At this time JS had entered the room, observed a few moments, then approached Kent, attempting to hold the bolt also. He attempted to push her hand away and she reacted with, "Don't be such a stubborn boy," and picked up the plastic screwdriver. Reaching around his body with her arm she placed a screwdriver in his hand and gently put hers around his hand on the screwdriver and began to turn his hand to loosen the bolt. This was successful in that the piece was disassembled. JS then moved back a bit and Kent picked up a second piece that needed to be unscrewed and immediately reached for the screwdriver and put it in the proper position and began to unscrew it. He evidently was not able to apply sufficient pressure, however. JS moved to the table and picked up some pieces; Kent immediately reached for the pieces and pulled them from her hand and replaced them on the table. (CF)

(102) 3/68 - Direct Observation. Several of the children had been engaged in making paper kites with tails and a long string so the children could raise them through the air. MO was involved in an activity with Karen where she would raise the kite high in the air and Karen would reach for it. Karen was apparently delighted by this with much running after MO and reaching for the kite. Kent stood near for a while, then began to engage in the kite-chasing activity. He was following along with Karen and repeating many of her actions such as reaching high in the air and reversing his body when the direction of the kite was altered. MO gave the kite to Kent and he smiled and very quickly extended his arm and moved his body as if to wave the kite in imitation of what MO had been doing. He didn't persist in this imitative motion very long and just began to carry the kite around the room for a few minutes, then walked to the block cupboard and began to play with some of the manipulative toys.

10:55 Kent walked to the observer and climbed saddle-fashion onto her lap putting both of his hands on her cheeks and with his head nose to nose with hers. He smiled and put his mouth on her sheek. His eye contact was very direct and quite focused. It was not at all looking-through. It might be noted that the observer is not a consistently familiar adult in the room. So Kent was not highly discriminative in
(103) his initiating physical contact.

Then in the following ten minutes, Kent initiated physical contact with the observer about three times. On the next occasion he put his body against the observer with his face close, looking directly into her eyes and smiled. He pulled on the observer's arm as if it seemed he wanted her to place it around his body. When she complied he left it there and leaned more against her body.

11:10 Kent was squatted down on the floor in front of the block cupbaord and had partially pulled out a box which is full of miscellaneous toys; there were cars, wheel cogs, pine cones, blocks, various and sundry objects. Kent was burrowing through these using his hands alternately and pulled out about eight to ten matching toys which were small, blue plastic soldiers obviously belonging to a set. Kent piled them all on the floor together and spent about five minutes burrowing in matching the objects. He didn't, however, use them or organize them in any way. Once they had been removed from the container he walked away to another activity. (CF)

(104) 4/68 - Direct Observation. Kent had arranged a set of building blocks in a new pattern, according to AS. They were arranged in four rows, very evenly with sides touching. All the sides with letters were placed up and each row consisted of one color--blue, red, green, and yellow.

During the same observation, Kent moved two heavy cupboard out into the center of the room which had been placed quite a distance apart. He began pushing one by giving a series of pushes from behind. Since the pieces were very heavy, each push required considerable force with little movement. Kent then walked to the second cupboard and began to shove it toward the other. He was trying to move it at an angle in order to meet the other cupboard. In order to do this, Kent shoved from several different positions around the cupboard. After several vigorous pushes which didn't move the cupboard, the observer moved beside Kent and gave a push with Kent when he initiated it. When the piece moved, the observer returned to her chair, and Kent continued to shove, this time with success. When it got stuck again, Kent looked toward the observer and took two or three steps in her direction, then returned to his pushing.

Alternately shoving and pushing the two cupboard, Kent persevered until they were together. He then looked where they joined and pushed them from the sides until they not only touched but were even with the edges exactly together and matched. When this was accomplished, Kent leaned against the cupboards and smiled. (CF)

(105) 4/68 - Direct Observation. AS was seated on the floor near the toy cabinet. Kent had been using blocks, then began to wander around. Kent approached AS, then he leaned his back against hers, moving back and forth a bit. AS reacted with, "Hey there boy, what are you doing?" in a playful tone. Kent leaned his head around and placed it in front of hers with a smile. He then walked away, but returned once again to repeat the leaning and reacting to her comments. This was repeated three or four times. (CF)

(106) 4/68 - Direct Observation. According to AS, Kent now reacts to verbal requests although this is not yet consistent behavior. A particular example was AS calling to Kent from across the room that it was his turn to ride on the truck. Kent immediately turned from what he was doing, walked to her, and climbed on the truck.

The observer attempted to initiate a peek-a-boo game with Kent in the setting of the children's room. The observer is familiar to the room but has not worked closely with Kent or maintained contact with him.

He had approached the observer and had pulled a jewelry chain which had been purposely tucked inside her blouse. Kent had, earlier the same morning, been attracted to this while in the dining room and had looked at it and jingled it.

While Kent was handling the chain, the observer held a tablet between their faces commenting, "Where's Kent?" He immediately pushed the tablet aside and continued to play with the chain. By the third or fourth time this was repeated, with Kent continuing to push the tablet aside, Kent looked into the observer's eyes, smiled and giggled. The pushing aside also became more immediate and rigorous. This was continued for about ten times.

After playing with the chain and engaging in the peek-a-boo, Kent walked to the toy cabinet and picked up two yellow blocks. He then held them close to the jewelry chain as if to match, holding his head to the side and looking steadily at the chain and the blocks. It was not possible to determine whether Kent was reacting to the colors of the gold chain and the yellow blocks or to the similar pattern of the chain and ridges on the blocks which closely resembled the pattern of the chain. (CF)

(107) 4/68 - JS commented that Kent had said "cracker" recently during the dinner hour. He had been engaging in his frequent pattern of crunching soda crackers into fine crumbs and then sifting them through his fingers. She began to share in the activity by also crumbling crackers, accompanied by a little song in which she said crackers with deliberate emphasis. After this has been repeated several times, Kent imitated her "crackers" verbally. (JS)

(108) 5/68 - Direct Observation. Gary and one of the staff members were assembling a puzzle on one of the bookcases. Kent walked from the other side of the room and stood near watching for several moments. He then reached forward and moved one of the puzzle pieces in the direction of the puzzle. The staff member put her hand over the pieces and Kent pulled his hand away. In a moment or two he again reached for another piece and the staff member repeated her motion of covering the piece with her hand. This was repeated three or four times. Then Kent picked up two of the pieces and walked away rubbing them in his hand. After a minute or two he returned to the cupbaord where the puzzle assembling was in process, and the staff member reached for the pieces and he released them with little resistance. He then smiled and patted the puzzle and walked away. About five minutes later Gary

had finished with his puzzle activity and walked toward the block cupboard. Kent approached Gary with a smile and a rather animated expression moving his face very close to Gary's and patting his face. Gary had no reaction and Kent continued his behavior briefly and then walked away.

After about five minutes Kent approached AS, moved his body toward her smiling, and emitted considerable vocal behavior in terms of intensity and intonation. AS reached toward Kent and he moved toward her outstretched arms; she picked him up, jumping him, immediately following one of his vocal outbursts. He continued vocalizing while she jumped him up in the air several times and the smiling and vocalization continued. AS then put Kent's feet back on the floor and she initiated this rather than Kent withdrawing from the physical contact. (CF)

(109) 5/68 - Direct Observation. During the day at Linwood, Kent removed all of his clothes, one time while outside in the morning and two times while inside. While his clothes were removed he urinated on the floor making three puddles, but didn't direct at any people or objects. Kent accompanied his undressing activities with smiling and occasional shrieks. When he was in the buff he ran around the room tapping his chest and smiling and periodically leaping in the air and emitting shrieks seemingly in great delight. (CF)

(110) 5/68 - Direct Observation. Kent was playing with plastic vari-colored ball which was about 14" in diameter. The ball was on the floor and Kent draped his body over the ball with his head on the floor and would roll back and forth on his tummy while on top of the ball. He jumped up, picked up the ball, and threw it vigorously at AS's head. His thrust was very accurate and he was laughing as he hurled the ball. A moment later, he threw the ball at Gary's head. AS commented that this was a new and frequent behavior in his use of the ball of throwing it towards someone at their head.

Kent dropped the ball to the floor and then walked toward Gary who was placidly standing nearby, and gave him a push. He then walked over to Dorothy who was sitting on the floor and gave her a push. Neither child had been interacting in any way with Kent prior to this time.

Five minutes later, Kent walked to K, a staff member, who was sitting on the floor, and leaned his whole body over her back; she greeted him with, "Hello, Kent,' and he smiled and walked away. As he moved from her he brushed his arm against her head and ran his fingers through her hair.

Kent then walked over to a cupboard, sat down, and took his shoes and socks off. This behavior of removing his clothes is very recent. A few moments later still with his shoes and socks off, Kent walked to a block cupboard. He had arranged five geometric puzzle pieces on the floor in a line with the sides touching, then stood up and used his bare toes to rearrange the pieces and then to re-align them still with the sides touching. He exhibited considerable toe dexterity. (CF)

(111) 5/68 - During the last few days, Kent has begun a new pattern. He collects saliva in his mouth and seems to swish it back and forth inside his cheeks. He has not yet tried to spit at anyone or anything, but is involved in just moving it around inside his mouth. I wasn't certain he was actually "full" of saliva, and I gently tapped his cheeks; the collection spurted out to indicate Kent indeed had a full mouth. (AS)

(112) 5/68. Throughout the day, Kent frequently fastens his eyes on AS and his eyes follow her movements. At one point, she was engaged on a conversation with another staff member. Kent came to stand beside the two of them, touched AS and then began to cry. (AS)

(113) 5/68 - Kent carried a book to a cupbaord and placed it on the top. He leafed quickly through the book but his attention didn't seem to linger on any particular picture. After a few moments, he closed the book, tapped the hard cover a few times with his fingers and walked away. Les walked near and picked up the book. Kent immediately returned and extended his arm and his body reaching for the book. It was necessary tor Kent to move after Les, and he pulled the book from Les's hand. Les offered little resistance. Kent placed the book back in the same position on the cabinet top, tapped his fingers on the cover, then he walked away. (CF)

(114) 8/68 - Kent was seated on a bench at the dinner table; three other children were at the same table. JS was serving the children. Kent took three or four consecutive bites from a chicken leg he was holding in his right hand, set the pieces down and using both of his hands, began crumbling crackers into fine crumbs. He added some rice from his plate to the mound of crumbs and mixed it all around on the table. He would alternately take a bit of chicken then a handful of the crumb-rice misture. During this time there was a consistent and high rate of vocalizing with varied intonation and sounds. Whenever JS would approach him to add another piece of food to his plate, his rate of vocalizing would increase and he would look at her and smile. (CF)

Chapter 9

The School Room

The experiments in the school room were designed to increase the reactivity of that environment just like in the other places in Linwood, particularly in the area of intellectual and verbal skills.

The activities in the school room, however, needed to be a blend between therapy and educational procedures. In a clinical treatment center, the two were intertwined so that one could not proceed without the other. Even an ordinary class room required a complex relationship with the teachers whose personal reactivity is a critical part of the educational process. Conversely, the structure imposed by the educational goals of the class room provided a context for the children's continued development toward a repertoire that could be sustained outside of Linwood. Because therapy activities have been described in detail already, this chapter will be limited to the concepts and procedures which are relevant to the child's cognitive development. It should be remembered throughout the discussion, however, that the clinical and therapeutic aspects of the class room procedures are inseparable in practice.

The plan of the chapter is to describe the use of reinforcement principles in educational problems in situations that are not confounded by the special problems of psychotic children. The first will be an experiment with semiliterate adults who already had a well developed verbal repertoire but needed increased fluency and enough expansion to be functional in the normal everyday world. The second experiment, with two dyslexic boys, is an opportunity to see how some of the technical problems of verbal development and programming were approached. These two experiments describe the basic technical procedures and the general context useful for other kinds of educational systems. At this point a brief discussion of the Linwood class room can take advantage of all the preceding technical descriptions.

The school room experiments were to develop class room procedures sufficiently structured that teachers could learn them with a month or two of instruction. The general plan of most of the procedures was to make the class room environment immediately reactive to the child's activities so as to provide a reinforcement schedule which would produce a vigorous and sustained engagement of the child's verbal environment. The entire educational procedure needed to be individualized and self paced so that the class room environment could meet each child's behavior as it was being emitted and advance in complexity as the repertoire developed. Every possible kind of reactivity (reinforcer), especially social kinds, needed to be developed and systematically applied but their application needed to be natural in the sense of chapter 3, rather than arbitrary, so that the repertoire which emerged from the class room would persist in the child's repertoire with other people than the school teacher and in other situations than the class room where the performances were acquired.

The ideal reinforcer which was to sustain the educational behavior was the increment in the child's verbal capability rather than stars, points, food or the teacher's approval, special privileges, promotion or access to special tags or places. Such automatic reinforcement of the child's verbal activity occurs when the educational repertoire allows the child to carry out activities which are themselves intrinsically rewarding. Extrinsic reinforcers such as stars, foods or special privileges may be useful as conditioned reinforcers to bring smaller parts of the child's repertoire into contact with the reactivity of the class room but they were not to be the eventual reinforcer maintaining the performances.

The educational procedures used in the Linwood classroom were a blend of teaching machines, broad applications of reinforcement principles to the overall design of the class room and some standard class room procedures. In every case where teaching machines were used they were a device like a book or pencil and paper which the student used to produce a new repertoire that would influence the teacher, other students or himself.

The experience acquired during the Linwood project and the underlying basic concepts were general enough and educationally valid enough so that we applied to a variety of educational situations. The individualized college instructional program using the interview that was described in Chapter 5 was one such application. Another application, perhaps closer to the actual classroom procedures used at Linwood, was used in a brief experience with five semiliterate adults to increase reading and general verbal ability. A description of this experiment will give the reader a concrete grasp of some of the broad programming principles, the use of teaching machines and the reinforcement procedures resulting from the overall management of the total class room environment.

Verbal Development in Semi-literate Adults With a Programmed Class Room

The experiment began without much testing of the students so as not to take away from the limited amount of instructional time that was available and because the motivational level of the students was so low that we thought it best to arrange a situation, as soon as possible, in which they could experience some success. We got an estimate of where to begin by a brief interview in which students read selected sentences from a graded series of Reader's Digest articles. We estimate a fourth or sixth grade reading level and verbal facility at about the same level. The initial assessment was confirmed by our later detailed experience. The major problem was a general weakness of the verbal repertoire. No particular verbal function was missing or needed special attention beyond that of any other part. For example, there was phonetic attack of almost all of the students is adequate, their thematic comprehension is consistent with their reading level and their general conversation, as is their level of verbal development in their ordinary conversation.

"Reader's Digest" selections designed for teaching English as a second language served as the primary verbal materials around which the instructional program was built.

The instructors who adapted the basic materials to the programmed format and actually carried out the instruction were two Georgetown University seniors who had training in general principles of operant reinforcement. Eva Mahoney, reading specialist of the Georgetown University Educational and Psychological Services Bureau served as a consultant.

The general principle of the Teaching program was a set of procedures taking into account the students current ability to read a text and incorporate it. The component activities were (a) reading aloud (b) answering brief questions about the text (c) relating it to a listener (d) taking literal dictation from someone else reading the text and (e) write answers to short questions about the text. Enough collateral support was given so that each student could complete each activity successfully, even though it might take some longer.

Procedures

Reading aloud. In the first task one student read a short article, speaking all of the words without any emphasis on understanding or remembering the article while another listened. An audio dictionary was supplied with each article so the student could listen to any of the difficult words, each of which is written on a card which can be matched with the text and inserted into a Language Master. The Language Master is a commercial tape recorder (Bell and Howell) which will play a small card on which there is a strip of audio tape. A card of convenient length plays for about four seconds. A simple definition of the word, taken from the level of the student's current language, is also written on the card. Each student reads aloud by himself with the help of the dictionary cards until he is ready to demonstrate his performance to another student who listens. They then reverse roles. When the students are satisfied with their mastery they read to the instructor for final verification. The interview is designed to provide a verbally reactive environment to expose the new behavior that the student has acquired. One main function of the instructor serving as a listener is to provide a standard of mastery for the students. The instructor needed to serve as a listener less as the student acquired competence and incorporated the high standard of mastery.

Teaching machine questions. The second procedure used a teaching machine similar in function to a multiple-choice test. The text, which the student has already read without emphasis on comprehension, now serves as a focus for a long series of multiple-choice questions which take him through the text sentence by sentence. The student usually reads the question from a text on the teaching machine card except when it is beyond the student's reading level. Then he can listen to the question by inserting the card into the Language Master. The student chooses one of the three alternative answers to the question from texts on the bottom of the card. The card is inserted into a teaching machine, which has three buttons positioned under the three answer-texts. Thus to choose a correct button the student needs to read (or listen to) the question, read the multiple answers, find and read the relevant part of the Reader's Digest text and then react to all of these meaningfully enough to press the button under the correct answer. Pressing the button under the correct answer makes a confirming noise. Typical questions might be: "What is the doctor's name?" Brown Smith Jones; "How old is the doctor?" 25 35 40; "Was the doctor discouraged?" Yes No; "Why did the doctor take the trip?" To tend a sick man Because he was sick To visit someone.

Other types of cards designed around the same text deal with phonetic aspects. For example, auditory: "What word in the fourth sentence ends like earn?" modern - on fan; Text: "What word is a color?" blew - blue; Experiences such as these cards will, in the long term, improve pronunciation by bringing the student's attention to the phonetic details of the word.

For students whose phonetic and textual distinctions are not well enough developed for differences as fine as those in the examples above, grosser details of text and sound are used such as: "What word begins like pet?" pen - set - dog; "What word rhymes with rat?" bat - rut - bit; An easier set of alternatives for this question for a student with a minimal repertoire might be: bat - run - fin.

Dictation. The first dictation procedure was a literal transcription of short sentences from the Reader's Digest text. The student plays a card in the Language Master to hear the sentence and writes the transcription on a piece of paper. He checks his transcription by referring to the correct text on the back of the Language Master card. When he has finished the five or six cards which are the assigned task, he repeats those cards on which there are errors, using a fresh sheet of paper until he has done all of them perfectly. When the student transcribes the text literally, it focuses his attention on the details of printed words and the relation between the textual form and its spoken form.

In the next task the student writes answers to questions given orally through the Language Master or in printed form if the text is simple enough. Here the task requires thematic comprehension but the student has the whole text available and he has already successfully written all of the textual forms before he is required to write a thematic reply. As in the literal transcription the correct answers are on the back of each card but the criterion for a successful performance is not so clear, so the performance is checked by a second student as well as an instructor. Students frequently provided considerable help for each other.

The Thematic Interview. Another procedure was an interview similar to that used to teach behavior principles in the Linwood training program. One student "told the article" to another, first with the text, and then without it. As with the other procedures, the instructors played a prominent role at first, frequently serving as a listener, but faded out of the situation as the student internalized an adequate standard of mastery.

The use of natural situations to reinforce reading and comprehension. A map of the city of Washington served as a primary experience around which the student learned to read texts directing him to mark a route from place to place.

Three by five cards gave the student a set of directions for proceeding from one location on the map to another. The student followed the route specified on the cards by marking the celluloid covered map with a wax pencil. The first card, for example, might read: Find the White House. Go on Pennsylvania Avenue until you get to 18th Street. Turn right. When he completed the route, an overlay with the correct route is laid over the map. This device is a general paradigm for teaching the student to follow textual instructions and to read. The experience of making the map gives the student immediate feedback only when he has read the instructions effectively. The texts on the three by five cards as well as the complexity of the route is easily paced to the reading ability of each student. With less advanced students there would have been an advantage of constructing a detailed map of the four or five blocks around the student's home, so that it would be certain that the speech to be prompted by the textual instructions was well established in the student's repertoire. Similar teaching devices could be programmed around mechanical devices or diagrams whose construction would be prompted by textual instructions.

A cross word puzzle, specially constructed from language we knew to be in the student's repertoire, provided another device to reinforce reading.

Programming

Most of the programming techniques involved designing a task which could be adjusted in length and difficulty so that the student could complete it. It was never necessary to break any of the tasks into the "blanks and frames" of the conventional programmed-instructions formula.

With some students who could not sustain either the study performance or the interview, the task was simplified by reducing it to a single paragraph at a time. The simultaneous experiences with the dictation procedures and the phonics and comprehension experiences with the teaching machines provided collateral support to the interview. The gradual withdrawal (fading) of these collateral procedures is also a programming technique.

The following report, by John LeBedda, one of the seniors who actually carried out the program summarizes the gains achieved by the students. The enthusiasm of the instructor is perhaps a datum of equal importance to that of the students.

"The greatest apparent benefit derived from this program was the fact that these people were given an academic situation, probably for the first time in their lives, where they were able to demonstrate their own ability to themselves, their classmates, and their instructors. This was pointed out in an interview with Mrs. R. after the completion of the program. She said that often in her other classes, other students would always answer the teacher's questions ahead of her either because they were "smarter or quicker." After this had happened several times the teacher would ask Mrs. R. why she had not answered any of the questions and give her an opportunity to answer one. She said her answer would usually evoke laughter from the rest of the class, which would embarrass her and make it less likeky that she would reply in the future."

"With our program the situation was entirely different. Each student worked at his own pace and stayed with a particular task until he or she was able to demonstrate mastery of that task to a fellow student and then to an instructor. If a student failed at a particular task there was no penalty involved, but rather he was given the opportunity to attempt the task again until he had accomplished it. This provided some satisfaction to the students to be able to achieve something successfully that they had originally failed. Both Mrs. H. and Mrs. R. told us that they would have dropped out of the program if they had not had this special course which gave them confidence by providing an occasion for them to show their ability to do the work."

"At first Mrs. R. thought that our teaching machines were magical because she could only remember details of the story when she was "asked" by the machine. Later in the program she demonstrated the ability to retell the details of any of the "Reader's Digest" articles in her own words in a completely coherent story. She even added her own interpretation to certain sections which added to her understanding of the text. From our discussion with her it appears that there is favorable transfer to her present job as a nurses' aid. She said that once she has read her daily instruction card she is now able to perform her duties without referring back to the card all day. She said she can remember which patients are in which rooms and exactly what she has to do with each. She also said she has found some of the other girls in the utility closet studying their instruction cards because they cannot remember what to do. She has had to help them with their duties when she is finished with hers."

Mrs. H. has been so pleased with her progress that she has decided to study math at night school in the fall. She had thought she was too old to return to school but has found that she is able to do the work. She said she does more reading now at home than she had done before.

"The students expressed the regret that the program was not longer but they have resolved to pursue their studies on their own. Mrs. H. is even going to get one of her neighbors who is in high school to do interviews with her on magazine articles and other reading material. I would like to suggest that if this program is

A cross word puzzle, specially constructed from language we knew to be in the student's repertoire, provided another device to reinforce reading.

Programming

Most of the programming techniques involved designing a task which could be adjusted in length and difficulty so that the student could complete it. It was never necessary to break any of the tasks into the "blanks and frames" of the conventional programmed-instructions formula.

With some students who could not sustain either the study performance or the interview, the task was simplified by reducing it to a single paragraph at a time. The simultaneous experiences with the dictation procedures and the phonics and comprehension experiences with the teaching machines provided collateral support to the interview. The gradual withdrawal (fading) of these collateral procedures is also a programming technique.

The following report, by John LeBedda, one of the seniors who actually carried out the program summarizes the gains achieved by the students. The enthusiasm of the instructor is perhaps a datum of equal importance to that of the students.

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"The students expressed the regret that the program was not longer but they have resolved to pursue their studies on their own. Mrs. H. is even going to get one of her neighbors who is in high school to do interviews with her on magazine articles and other reading material. I would like to suggest that if this program is continued next year that these three students be invited back to act as course assistants. They have all cooperated very well in the project and I think they could be of great assistance in the preparation of materials and the smooth operation of the procedure. I think it would be quite beneficial to all involved with the program.

The summary indicates that the major accomplishment of the instructional program was an increase in frequency (reinforcement) of existing verbal behaviors. The educational product is an inclination to behave verbally in the classroom and elsewhere. Given initial verbal level of these students and the natural reinforcers in their normal environments, we can expect continued expansion of their verbal repertoires.

Teaching Reading to Two Dyslexic Children

Although some of the project experiments with teaching machines were with individual children at Linwood, the main experiment was carried out outside of Linwood, with two dyslexic boys. This experience was designed to be an opportunity to develop programmed material, teaching machines and procedures as well as to train Miss Smiley, Mr. Rosche and Mr. Silva, Mrs. Jogerman and others. The project staff, principally Ellen Smiley, took charge of the Linwood school room after this experience and because they had already mastered the technical problems of programming and arranging verbal materials could concentrate on integrating the programming procedures with the clinical requirements of the autistic children. The clinical aspects of the experiment were supervised by John L. Cameron who referred the boys to the experiment and provided the following clinical comment.

Sam: eleven years old; reading level - below first grade

The father stated that he was concerned because he had been told by his son's teachers that he could not read. The boy seemed to him to be making no progress whatsoever at school in other subjects. The school staff was of the opinion that he was brain damaged but medical opinions did not support this contention.

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The parents were interviewed in an informal meeting in which it was possible also to observe their interaction with their own son. There the main feature was an anxious nagging quality on the part of the mother and an increasing frustration bordering on explosiveness on the part of the father.

Later when interviewed both parents expressed puzzlement, despair, and perplexity. The father was working overtime to set aside money for his son's future care. If the school was right, he believed his child might never be able to earn his own living. This overwork led to his absence from home, and to his being too tired to be effective when he was there. The mother thought she was bad for her son, that she was ineffectual and irritable around him. The father, whom the mother thought had a better relationship with the boy, was of the opinion that he was too bad tempered to be useful.

They gave a clear and accurate medical and developmental history of the boy. He had been severely ill just after birth as an operation for pyloric stenosis had led to massive internal hemorrhage. For over a month he had been close to death, from then onwards the parents had tended to regard him as "delicate" or "special" in some ominous but ill defined way. The mother, for example, had not been able to deal with his temper tantrums effectively when he was tiny, stating that somehow they seemed more difficult for her to control than those of her other child. However, his development had appeared to them to be normal until they were told that he presented a reading problem in first grade. Socially he developed satisfactorily after he formed friendships with other children, played games, etc. However, he increasingly showed a dislike for school and would frequently ask for books as presents, but then never read them.

It was clear that the rules of living in the family were ill defined and diffuse in a rather slight way for the boy, because of the parental difficulty in standing their ground.

The boy himself was a rumpled little individual, who hung his head, was unsmiling and was unhappily aware of the investigator's scrutiny. He was slow in his responses, was non-committal about himself and was silent unless prompted. He did not liven up until he was told he could go to play with some children.

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Bill: 8 years old; reading level below first grade

This family, of upper middle class, was referred by a mutual friend because they were concerned about his inability to read. T hen the parents were originally interviewed they were under considerable strain and expressed great alarm regarding their son's educational difficulties. In describing his history and development they stated that they had noticed nothing peculiar about him except that he seemed a little clumsy and not as well coordinated as he might have been. Their first indication of trouble had manifested itself while the boy was in first grade where he had simply not learned to read. Although the school was a private one where the student - teacher ratio was 16:1 the efforts of the school were ineffective. The family at that point sought medical help, but neurological investigation was inconclusive. When they were asked directly what they thought was the matter the father said with great pain that he thought that the problem was hereditary. He himself was stupid and he thought that his son had acquired the same deficiency genetically. This statement full of pain and depression was quite odd when one read that the gentleman in question is a highly successful businessman in a difficult and competitive field.

Once again discussion of the family pattern of living showed minor features of lack of order, indecisiveness and general formality. Even the meals sounded more like a casual picnic than part of the routine of a well-to-do family. The children's rising in the morning, getting washed and going to bed at night were all described in the same rather vague way and were clearly major and time consuming productions for the mother. The television seemed to dominate the environment and there was a peculiar lack of emphasis on cultural activities and books in the family setting.

The boy himself was a well-dressed little boy, outgoing in manner, but restless and jerky in movement. He seemed inattentive and distractible. His first comment to the interviewer was to the effect that he was a clever boy, but the remark ended on an interrogatory note.

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Basic procedures

The basic procedures were similar in content to those which were described for the semi-literate adults except for the content and level of difficulty. The primary texts were standard sequences of primers and readers. Several different books were used at each reading level. There was an audio dictionary for each book, consisting of a 3 x 5 card with each word in the story that might have caused difficulty. A piece of audio tape across the bottom of the card contained the word and its use in a single sentence. The boys could hear the word and the sentence by inserting the card into a Language Master. A separate alphabetical file for each book in each series allowed the students to listen to almost any word.

The multiple-choice teaching machine described earlier was used to teach phonics and to focus the reader's attention on particular parts of the text. Interviews were used in which the child read to the instructor. Dictation and thematic questions were also programmed with the Language Master. Thousands of cards in each of these areas provide a carefully graded set of experiences so that each increment in the verbal environment could be very closely paced to the child's current capability. A wide range of verbal materials at each level was also necessary for generality. A structured reading program emerges to be used as one component of a total class room program. Part of it will be described in an appendix.

Initial Assessment in the laboratory

The following account, by M. I. Roche Silva, describes how the youngsters were introduced to the situation and their conduct at the start.

"The first contact with each boy was an attempt to establish a viable social relationship. For that purpose, the first interview in the laboratory was rather brief and oriented mostly towards an analysis of the social repertoire, as well as a tentative evaluation of his reading problem. We tried to familiarize the child with the general surrounding, we introduced him to the Bell & Howell recorder and the teaching machine, to which each child immediately responded with questions about the functioning of the equipment."

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"As Sam came in with both parents, he looked uneasy and was fidgeting nervously with his fingers on his belt. He looked at me and his response to my greeting was clearly voiced but his words had a shaky quality. As I asked him if he would like to do some work, he did not respond but followed me into the little room where our teaching equipment had been placed."

"I asked Sam to read a few sentences in an easy first grade primer so that I could make a first evaluation of his reading ability and of his difficulties. He started reading, moving nervously in his seat. There were hesitations on each word on the first sentence and then a few words which he evidently did not know but these were not more than one or two in each following sentence. I waited when he hesitated and let him struggle a little until he overcame his nervousness. I told him those few words which he could not read. Each completed sentence was followed by a "very good." His main difficulty seemed to be a reversal problem and omission of a syllable at the end of or in the middle of a word, such as reading "no" instead of "on" or "ring" instead of "ringing." A few times he omitted a whole word in the sentence or even reversed the order of two consecutive words. This did not really change the meaning of the sentence. I purposefully did not correct him. He was smiling and evidently more at ease at the end of his reading. He read half a page. Next I showed him how he could match an unknown card on the book with the corresponding one on an auditory file card previously prepared for the Bell & Howell recorder; how he could run this pre-recorded card through the Bell & Howell recorder and hear the word; how he could then proceed to complete the reading of the sentence which contained the unfamiliar word. Next, I selected one sentence at the beginning of the book and let him do the work on the Bell & Howell on his own. Sam was a little nervous as he read the sentence and stopped at an unknown word. He found the matching word in the auditory and was evidently pleased to hear the word and then continue his reading. He told me he liked the little machine. The same procedure was repeated and Sam again completed the reading of his next sentence."

"As we wished that this short visit would be pleasant for both the parents and the child, the parents were entertained while I took the child through this short reading session and reinforced that performance with a visit to the chimpanzee laboratory.

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As I was about to go up to the laboratory, the parents who looked worried as we started out offered to accompany Sam. I declined the offer and suggested that they should finish their coffee which Miss Smiley had just offered them. Sam was delighted to see the chimps and told the parents about it when we came down.:

"Bill came one week later with his mother. Contraryto Sam who greeted us in a shy but audible and pleasant way, he looked down and mumbled a few unclear words. When he was led to the small reading room, he asked about the equipment and tried to work as soon as he was given an explanation. He ran the cards nervously through the Bell & Howell, dropped them a couple of times but was pleased to be able to match an unknown word in the primer with the word on the auditory card. He ran each auditory card more than once through the Bell & Howell and repeated the word aloud after he heard it. Bill read his sentences with more effort than Sam because he encountered more unknown words. But he did not exhibit reversals, nor did he omit words in the sentences. He was hyperactive and even more restless than Sam. As with Sam, every completed sentence was followed by a 'very good" and again the completion of the short session was reinforced with a visit to the chimp laboratory. The duration of this visit was also not more than one-half hour.

As the boys left, they both welcomed the idea of a second meeting. We scheduled them for twice a week after school. They came at different times so that the instructors could observe each boy very closely, in spite of the fact that they worked on their own. These meetings lasted from 30 to 45 minutes."

After two weeks of sessions which were similar in content to the first one, after there was a better idea about the boys' reading level and their difficulties, the sessions were programmed in more detail. The programming consisted of: a) selection of a suitable text well within the boys' capability; b) preparation of phonic cards; c) completion of auditory dictionary cards containing all the words in the text; d) preparation of word game cards (loto); e) comprehension cards; f) dictation.

For the next two months the boys were scheduled for twice a week after school for 90 minutes, and both were coming now at the same time.

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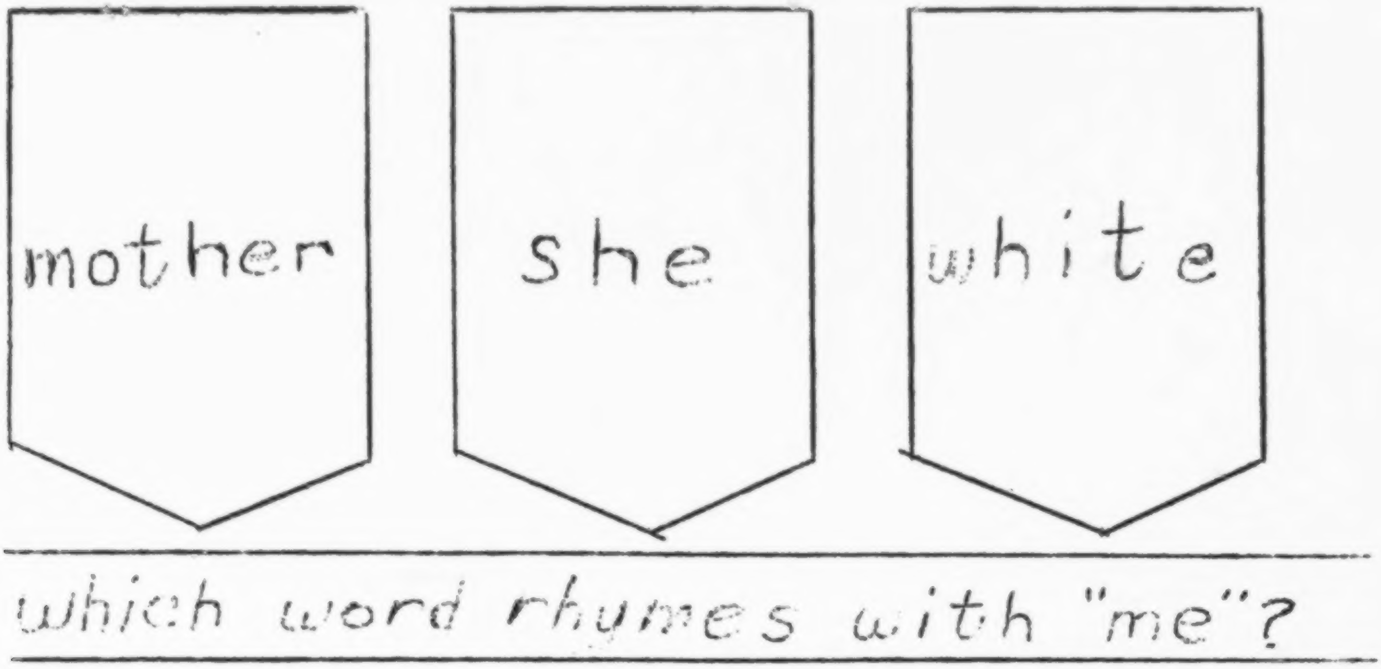
Alphabetical auditory file

The Language Master made it possible to shift the responsibility for learning to read the text to the child. A text was chosen that was generally within the child's capability. For those words which the child could not read he could refer to an alphabetical file of audio cards. Thus the instructor's role was to provide materials relevant to the child's current repertoire and to react to (reinforce) the performances that the child engages in. The instructor's ability to follow the child rather than to goad him is possible because of the structure of the reading situation which gives the child control of the learning activities with the paced materials and the audio dictionary.

Phonovisuals, phonics, word skills and meaning

Another kind of activity on the teaching machine was designed to teach the child to attend to the details of words, to make phonetic attacks, and to train the child to react meaningfully and verbally to the text he has read. Most of these procedures were carried out with the multiple-choice teaching machine that has been mentioned previously. The illustration below shows a typical card in the actual size it was used.


mother
she
white
which word rhymes with "me"?

The band across the bottom of the card denotes audio tape which will allow the child to hear "which word rhymes with *me*" when the card is inserted into the Language Master. The card is then inserted into the teaching machine and the child can press one three buttons on the machine under each of the texts "mother" "she" and "white." Pressing the button under *she* produces a tone; pressing the button under one of the incorrect choices does not. The coding is accomplished by a piece of conducting tape on the back of the card under the correct choice which closes a circuit on the teaching machine.

Programs. Thousands of cards were prepared since a child could complete a single card in as little as 10 or 20 seconds. These cards eventually were formed into a library at Linwood of sufficient variety and number that programs could be constructed by pulling cards out of the files. Each child usually offered special problems that required the teacher to construct new cards but these too were placed in the "library" perhaps to be used for another child. The difficulty level ranged from simple color matching, for non-verbal children recently arrived at Linwood, to thematic cards for Sam and Bill which asked "What did Jack and Jim want?" They wanted to play together -- They wanted the little puppy.

The following table will give the reader some idea of the kinds of cards that were constructed. A letter "A" preceding an instruction indicates that it is recorded on audio tape on the card. The letter "T" indicates that the instruction is written on the card. Some cards had both audio and textual instructions. Sometimes there were two choices and sometimes, three.

Various Types of Teaching Machine Problems

Instruction or Prompt	
1. A: Which word begins like "yes?"	1. bet 2. yellow 3. has
2. A: Which word begins like "yes?"	1. guess 2. bus 3. young
3. A: Where is the sound "p" in "snapper?"	1. beginning 2. middle 3. end
4. T: Where is the sound "p" in "snapper?"	1. beginning 2. middle 3. end
5. A: What word rhymes with "saw?"	1. claw 2. box 3. dog
6. A: What word rhymes with "saw?"	1. claw 2. sew 3. Ma
7. A: What word begins like "bet?"	1. boat 2. tab 3. tub

8.	A: What word ends like "silent?"	1. boat 2. tab 3. tub
9.	A: What word ends like "silent?"	1. some 2. band 3. sent
10.	T: Wouldn't	1. could not 2. would not 3. will not
11.	T: Daddy ___ up the balloon for me.	1. blue 2. blew
12.	T: The policeman is ____ every car.	1. stops 2. stopped 3. stopping
13.	T: "What did Jack and Jim want?"	1. They wanted to play together. 2. They wanted the little puppy.
14.	A picture of a dress.	1. br 2. dr
15.	T: 8	1. ate 2. eight
16.	T: What word rhymes with great?	1. ate 2. at
17.	T: Big	1. Picture of a big box. 2. Picture of a small box.
18.	A: Which one is bigger?	1. Picture of box. 2. Picture of a smaller box.
19.	Picture of a ball.	1. Picture of the same ball. 2. Picture of a box.
20.	Picture of a ball.	1. Picture of a different box. 2. Picture of a box.
21.	Picture of a ball.	1. Picture of a small ball. 2. Picture of a box the same size as the ball.
22.	Picture of a small red car.	1. Picture of a large blue car. 2. Picture of a small red house.
23.	Picture of a boy.	1. Picture of another boy. 2. Picture of a girl.

The difficulty of the cards ranges from No. 19 where simple forms are matched with each other to questions such as No. 13 where the child is required to read complex texts and respond to them thematically. Numbers 1 - 9 are examples of cards designed to teach a phonetic attack on texts. There are several illustrations of how the difficulty of the problem is adjusted by changing the choices so they require fine or gross distinctions. The difference between Nos. 5 and 6 lies in the greater chance of confusion among the choices. Cards such as No. 13 are designed to provide steady pressure on the child's reading style to incorporate the behavior generated as he reads the test. The child can complete the cards successfully only if he has read and remembered the story that the cards refer to. Many of these, as well as the phonic cards are adapted from conventional workbooks and teacher manuals. Nos. 18 - 23 illustrate the way the same teaching machine is used with pre-verbal or pre-reading children.

The multiple choice teaching machine was used with a simple relay control device which allowed the teacher to program dynamic aspects of the students' interaction with the programmed cards. One feature allows a token to be dispensed automatically when a certain number of cards were completed successfully. The instructor sets a dial to arrange the required number. The token usually had no other significance than signalling the completion of the task but it added reactivity to the student's performance and therefore helped define and sustain the performances.

Another feature of the device made it possible to reset the number requirement. Typically, a talk would consist of six or eight cards. After completing each card, it was put at the back of the pack and the token is delivered when the student achieves six correct cards without an intervening error. The resetting requirement was frequently useful as a way to prevent "careless" errors. Other features, more useful for pre-verbal children in the first experiences with the teaching machines, included a circuit which counted only performances where the first choice was correct. Another circuit permitted a token to be delivered after every correct choice. These various programming features could be adjusted, particularly during the first experience in the class room, to sustain the child's performance under more and more stringent conditions. Eventually these procedures were unnecessary when progress in the educational program became the reinforcer maintaining the student's performance.

The experiment was begun by experienced teachers who were to develop a structured class room which relatively untrained teachers could learn and take over. Most of the initial development was carried out by Mrs. Roche e' Silva. Once the basic class room structure was established, Miss Smiley, then a recent college graduate with an undergraduate major in psychology, took over preliminary to taking charge of the Linwood school room under Jeanne Simon's supervision.

Dictation. The Language Master also served as a teaching machine for dictation. The procedure was as follows: A student was given three audio cards on which a simple sentence was recorded. The student listens and transcribes the cards one at a time. He checks his transcription by comparing it with the correct text on the back of the card and circles errors; when the student has transcribed all of the cards he calls the instructor who collects the corrected paper, gives him a fresh sheet, and the student rewrites those sentences in which there is at least one error. The process continues until the student writes each sentence without any errors. He then goes on to the next activity.

Class sessions were 90 minutes long, usually after the regular school day. Each boy had a study card in the class room where all his materials were kept. The corresponding phonic cards for the day were placed in a small box beside the Bell & Howell Language Master and the teaching machine. The alphabetical file containing the auditory dictionary cards was beside the book.

The boy was first asked to prepare his assigned text in the reader, usually several pages. He could look up any word that he could not read in the alphabetical file and run it through the Language Master to hear it. He could listen to the card repeatedly. When the child finished his study he read to the instructor. If he read correctly, the instructor conversed and asked him questions about the content of the text. If he couldn't read the text, he re-studied it for another interview. The instructor also took such occasions to reassess the student's problem and design supplementary material or exercizes, or give personal or other support.

After successful completion of this first task, the child went to the multiple choice teaching machine. The child was usually asked to complete correctly a pack of six to ten cards before calling the instructor, who would then check the result and give the child a chance to talk about the material before proceeding to the next activity which was usually a social experience. Sometimes the mother and the one or two boys played a verbal game. Sometimes the instructor participated, other times the children visited various laboratories in the building. At one stage of the program, games and models were available for the boys. At other times there were outdoor games or a short excursion in the neighborhood.

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The Remedial Program

The text, the oral questions and the phonic cards for each lessor were carefully prepared in advance. Errors in the previous meeting drew special attention particularly if they occurred repeatedly. Usually the rate of progress was down on these occasions by increasing the amount of material relevant to a simpler level of study. The amount of work in each of the tasks was increased very gradually. On several occasions the boys volunteered to do extra tasks. Several times, however, the work requirement had been increased too rapidly and it was necessary to readjust it. The four or five sentence requirement at the beginning of the experiment had increased to three pages in the first grade reader by the end of two months of experience in the school room.

The Probe or Interview

The instructor's interaction with the child was not carried out as a test and had no punitive consequences. It was used as a way to give the child feedback about his own educational achievement and to give the teacher data about how successful the class room procedures were. The probe was an important device for building up the child's confidence because each increment in his reading ability was immediately demonstrated to him as soon as he completed a task. The teacher observed the child's progress and difficulties in order to have the data with which to modify the materials and teaching program.

The relation between the probe or interview and the study behavior of the student has been described in *Behavior Principles*.

The experiment used a simple teaching machine in which the child could press a button under either of two texts; *cat* or *dog*. With one type of card the child saw a picture of a cat. With another, the child heard *cat* when he put the card in a tape recorder. If, when looking at a picture of a cat or hearing the word *cat*, the child pushed a button under the text *cat*, the machine made a sound indicating a correct performance; after four successive correct performances the machine delivered a token which could be cashed for toys. If, however, the child pushed the button under the text dog, the child would need to repeat the four cards until he got all four cards successively correct. Other cards, of course, required the choice of the text dog. Although the child made some progress toward reading skill, his performance was sloppy and uneven. Many errors occlurred. the Child didgeted, was distracted by anyone who passed and occationally pushed one of the buttons accidentally with his elbow while his eyes warsered the room (typical behavior, perhaps, of most very small boys in a classroom but not conducive to learning to read).

We speculated that the boy was not performing accurately because the reinforcement occurred after pressing buttons rather than after the actual performance we intended to produce. We, therefore, decided to reinforce reading directly. Now the child was given a pack of ouur work cards and told: "study these cards on the machine. When you are all through, bring them to me and I'll see if you can read them." When the child brought the cards back and read them correctly, he was given a token. If he was unable to read the cards, the instructor returned them and said "I think you'd better go back and study them on the machine some more. Come back when you can read them.

Almost immediately there was a shift in the child'r performance. He became intent on the machine. His lips moved and his finger hesitated as he shifted from choice to choice before pushing a button. A new set of subtle behaviors was being reinforced which for toys. If, however, the child pushed the button under the text dog, the child would need to repeat the four cards until he got all four cards successively correct. Other cards, of course, reauired the choice of the text dog. Although the child made some progress toward reading skill, his performance was sloppy and uneven. Many errors occurred. The child fidgeted, was distracted by anyone who passed and occassionally pushed one of the bottons accidentally with his elbow while his eyes wandered the room (typical behavior, perhaps, of most very small boys in a classroom but not conducive to learning to read).

We speculated that the boy was not performing accurately because the reinforcement occurred after pressing bottons rather than after the actual performance we intended to produce. We therefore decided to reinforce reading directly. Now the child was given a pack of four work-cards and told, "Study these cards on the machine. When you are all through, bring them to me and I'll see if you can read them." When the child brought the cards back and read them correctly, he was given a token. If he was unable to read the cards, the instructor returned them and said "I think you'd better go back and study them on the machine some more. Come back when you can read them".

Almost immediately there was a shift in the child's performance. He became intent on the machine. His lips moved and his finger hesitated as he shifted from choice to choice before pushing a button. A new set of subtle behaviors was being reinforced which was difficult to specify, but which made clear that reinforcement of the actual reading performance rather than the botton pressing had shifted the repertoire dramatically. Once reinforcement occurred directly as a result of reading, the child was inclined to develop the study behaviors that led to reading.

The Role of the Classroom Instructor

The activities of the teacher were somewhat different from those of the conventional classroom. Her activities were less concerned with conveying the content of the instructional program than with providing materials and instructions with which the child can accomplish a small but carefully defined goal. She then reacts to and certifies the child's achievement. Much of her teaching activities occurred between classes in assembling and designing materials for experiences to meet the child's existing capability. The actual teaching procedures in the classroom with the children were routine.

Observations of the Students

The most apparent changes in the boys' behavior occurred as early as the second week, and progress was observed throughout the first two months. They smiled more often and even boasted about their achievements in class. They started telling each other about the increased number of sentences they were reading and were eager to come to the next meeting. Their restlessness and distractions, in spite of some fluctuations, were gradually declining. Their manners became more outgoing, and even the tone of voice had acquired a more stable quality. A few special events might be a better illustration of the change in their general behavior.

Shortly after completion of the first month Bill came in with an air of triumph and announced that he had read to his class in school that day. According to his mother, he had refused to do it up to the present date and she was also very pleased with her son's success.

With Sam, progress was also manifest. He asked his mother for a new book and was able to read a few sentences to his father, although not without occasional help. But, according to his parents, he had always vigorously avoided reading before. The rate of making errors decreased when there were fewer unknown or difficult words.

Psychiatric Implications of the Pilot Study on Reading Problems

Dr. Cameron recorded the following implications of the remedial experim

There were some interesting psychiatric implications in the pilot study. Although reading difficulties are commonly regarded as part and parcel of the commonest psychiatric syndrome among children (behavior disorders) the presenting complaint of a failure to learn to read is seldom if ever heard by the practicing clinician. However, the patterns in both families studied revealed that the parental management had contained fairly clearcut deficiencies of discipline and control such that the child had in the classroom situation been unable to produce the necessary patterns essential to the acquisition of an ability to read. This particular problem for the child had not in either case led yet to the kind of behavioral manifestation which alerts the parents to the need for psychological help.

As can be seen from the initial psychiatric evaluation of the two boys, both of them presented what can be regarded as subclinical features of psychiatric disorder. Scott was a rather untidy little boy whose clothing was dishevelled and rumpled. His facies were hangdog, his head was bent, he did not smile very much and his movements were slow. Speech was slow, though accurate in content. In discussion with the interviewer he talked quietly and did not livenup except when discussing after school play with his chums. He was quite uncommunicative with regard to school but spoke to the interviewer's children telling them vehemently how much he hated it. Bob was a neat, active, rather bouncy little boy, who smiled a great deal and who seemed in a superficial social sense to be well adjusted. When one watched him closely, however, it was clear that he was a rather uneasy anxious little boy, much of whose activity was unstable and distractible.

As the training in reading began the first observation made was that both boys, in an impersonal and structured situation, in fact could read and were doing so with a reasonable degree of success. Within a month the subclinical depressive feature in Scott had disappeared and the manifestations of anxiety in Bob were reduced. From then onwards to date these factors in Scott have not returned and his reading rate has continued with a rather regular positive acceleration, interrupted only at one point where the technique was modified. With Bob, however, the course has fluctuated much more. There have been peaks of quite high learning, followed by sudden and dramatic drops in which the rate of learning dropped sharply and the error rate increased in just as marked a manner. One repetitive factor in such disruptions was distrubance in the family situation, such as parental response to unfavorable report cards from the public school. Another such factor was any change in the system of the teaching, as occurred when a less personal system was introduced after the first two months.

The nature of the disruptive factors was varied, but the reactions of the subjects followed, for each individual, the same pattern. What emerged at such points, was the same type of rather useless behavior which impeded the learning process. During these periods evidences of the subclinical syndrome which had been noted in the particular youngster manifested themselves and remained until the particular task set had been completed.

It is easy to be misled into making too direct an analogy between the correction of the reading deficit with the consequent disappearance of the subclinical manifestations of depression and anxiety on the one hand and the amelioration of gross emotional and behavioral disturbances as the result of psychoanalytic techniques on the other hand. Nonetheless, the possible psychiatric implications of positively influencing or even aborting a potential psychiatric disorder by such a limited and highly controllable intervention as the one utilized in the pilot study, is certainly worthy of further scrutiny on a larger scale to ensure that these limited observations are not artifacts of the two subjects studied.

The classroom teacher had been quite effective with children who responded to the conventional classroom procedures. Some of these children had gone on to public school as a result of their development in the Linwood classroom. With other children, there seemed to be little benefit, however.

Programmed Instruction in the Linwood Classroom

The introduction of programming techniques into the Linwood classroom was begun gradually when Miss Smiley took over the remedial program with the two boys. The plan was to gradually prepare the Linwood children and teacher for the kinds of changes that Miss Smiley would introduce when she completed the remedial reading experiment.

This was done by daily visits to the Linwood classroom by one or the other of three Project staff, two of whom were certified teachers.

The style of the Linwood schoolroom before the Project, emphasizing therapeutic activities, resembled a conventional classroom. The following notes by one of the project school teachers describes the school room as it was.

"There are up to 8 children in the school room. The room had a pleasant aspect. Most of the children looked depressed, staring at a fixed point with an empty look, engaged in a sort of repetitive activity, such as rolling a small gadget around a pencil, rocking back and forth or just asking the same question over and over. One or two were busy writing or drawing. The classroom teacher was explaining something at the blackboard, but no one appeared to follow her explanation. Most of the times that she asked a child a question there was no answer. When she sat down next to a child to get him to do some work the others were not engaged with any functional aspect of the classroom environment."

The first visits were an attempt to interact socially and find out what reinforcers could maintain some constructive behavior, for periods of time. These were then used to find out at what level of ability (coordination, drawing reading, writing) each child could operate. The disparity of the children's ability in basic subjects, such as reading writing and arithmetic, was enormous. One boy, aged 12, could read fluently with good comprehension, but his writing was extremely poor. It was difficult for him to copy a single word without some interruption. He was interested in geography and texts in geography were used to reinforce writing. Arithmetic was also a problem mainly because of his writing difficulty.

Another boy, aged 10, could write well and his spelling and reading could be rated as corresponding to second grade. But, there was no comprehension. He managed to answer the primer questions about the text in a sort of mechanical way, matching the words of the question with those in the text, but as soon as the same question was made in a different way, he was unable to answer it. He was also unable to give an account of what he had read.

A brain-damaged girl, 17 years old, had so far not been able to engage in any activity whatsoever. She would either sit there motionless or mumble things unintelligible or draw circles for a long time. After about a month we knew each child's working ability better. During this month an activity chart was developed. The completion of each step led to the next. For most of the children, only one or two short steps could be scheduled at a time. This would then be followed by a game which the child would choose to play with one of the visiting teachers.

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At this point in the project, the regular teacher was assigned to give each child the material for each activity and to attend to him whenever he had completed it. When two children finished at the same time, one of the visitors took the teacher's role or the child was told to wait.

All the activities in the small adjoining room, where there was a teaching machine like the one described previously, were supervised by one of the project staff.

The Report Book

Each child was given an entry in a report book, where all the details of the day's activity and of his behavior were written down. When the visiting teachers arrived in the morning, they consulted the previous report concerning each child before scheduling his activities for the day.

The Activity Chart

The activities for each day were sequenced to lend support for current activities which were difficult for a student. Thus the first tasks in the day were designed to accomplish part of the goals of the second task. The interrelation provided collateral support for the child's area of difficulty. For example, if a child had difficulty in writing, he would either be given a programmed instructional Manual in which he had to complete some letters. Then he might insert a missing word in a sentence in his workbook. Following this he would copy some letters or words on the magnetic board or three or four word sentences in his workbook. The successful of these activities would then be followed by a game. In the case of a reading difficulty, the child would be asked to read some simple known words which the teacher had previously composed on the magnetic board. This would then lead to a short meeting with one of the visiting teachers in the adjoining room. There the child was assigned one sentence or more, depending on his reading ability. Whenever he stopped before an unknown word, he would match it with the same word on an auditory card for the Language Master. There were never more than three or four cards laid out by the Instructor. When more than one sentence was assigned, the instructor would put out the audio cards relevant to that sentence. The child would then run the auditory card through the Language Master. Considerable clinical judgement needed to be exercized at this stage about setting limits.

After several months both the children and the classroom teacher were fully acquainted with the chart procedure. Each completed activity lead to a check by the classroom teacher and in turn lead to another activity which in turn lead to a preferred type of work such as a teaching machine or a game chosen by the child. The performance sequences gave the children and the teacher the experience that a day's work was within the limits of their ability and that completed tasks were conducive to pleasant situations.

At this point the classroom was further structured in the direction of the one that has already been described for the two dyslexic boys. The new structure gave the teacher an even different role than heretofore. A metal mail box with 12 rows of 8 compartments supplemented the activities chart. Each vertical row of 8 compartments was assigned to each child and the series of activities for the day were placed in vertical order. The child found the materials and instructions for his first assignment in the top compartment and so on. The responsibility for initiating activity was now with the child and the teacher's role was to react to the accomplishment when it occurred. Miss Smiley then took over the classroom with the teacher as her assistant. Soon afterwards the entire classroom was redesigned using study carrels for each child and for the larger number of teaching machines, tape recorders and Language Masters that were now right in the school room. All of the programming procedures, teaching machine materials and broad classroom arrangements that were developed in the experimental program with the dyslexic boys were easily adapted to the Linwood classroom. Most of the supplementary experiences that were necessary stemmed from the primitive level of development of the children which required that all of the verbal developments of the classroom be supplemented by actual experiences. One result of the new structure was that Miss Smiley was now free to observe the children carefully and to carry out many constructive clinical objectives, in collaboration with Jeanne Simons.

CHAPTER 10

CLINICAL DESCRIPTION OF THE LINWOOD POPULATION AND EVALUATION OF THE CHANGES IN THE CHILDREN IN THE LINWOOD PROGRAM

This chapter characterizes the population of the children who were treated at Linwood and studied in the project so the reader may know, more factually, what kinds of children were the focus of the therapy and the project's study. The second part of the chapter attempts to describe, at least roughly, the ways that the children changed while they were being treated at Linwood. These descriptions will also add more detailed information about the kind of children the project began with.

The descriptions of the children presented in this chapter are primarily clinical. The terms, therefore, may not be meaningful to the non-clinical reader who does not have the background of experiences with disturbed children that allows him to recall actual behavioral events for which the clinical terms are summaries. The clinically-trained reader, who has familiarity with terms such as "relate to," "primary and secondary process," or "appropriately directed aggression" has used these terms to describe and to differentiate many interactions with actual children when detailed observations of the child's behavior was the basis for the distinctions. The non-clinical reader, without these experiences, is at a disadvantage. For the reader without clinical experience who wishes to study the data of this chapter in detail, the analysis of a single child in Chapter 8 provides a key for constructing the referents for the shorthand clinical descriptions. The detailed observation of the child, Kent, both in Chapter 8 and in the Appendix, provide the referent to which both the clinical and operant terms are directed.

Description of the Linwood Population

The project was fortunate to have the services of Professor Leo Kanner who originally identified the clinical entity of infantile autism in diagnosing the population we are working with. Two evaluations of the Linwood children were carried out: one in the Fall of 1967 and one in the Spring of 1968. The entire text of Professor Kanner's evaluations are included in the appendix.

Of 38 children who had been in Linwood during the period of the Project only 23 had both an initial and a final evaluation by Professor Kanner. The following table shows the age range and sex of these children.

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INITIAL EVALUATION

TABLE 1

Age	Boys	Girls	Total
2	1		1
3	1	3	4
4	2	1	3
5	3		3
6	3		3
7		1	1
8	3		3
9	4		4
10			
11			
12			
13			
14	1		1
15			
Total	18	5	23

The large number of children under eight reflects Linwood's bias toward younger children, particularly in the case of the girls. The larger number of boys than girls confirms the same statistics in other treatment centers for schizophrenic and autistic children.

The next table shows diagnostic categories into which Dr. Kanner put these children. Over 50% of this group have been given the diagnosis of infantile autism and all except 4 represent some kind of childhood schizophrenia.

TABLE 2

Diagnosis	Boys	Girls	Total
Retardation	2		2
Autism	11	3	14
Schizophrenia	3		3
Oppositional Syndrome		1	1
Postencephalitic	1		1
Hospitalism Syndrome	1		1
Undiagnosed		1	1
Total	18	5	23

Table 2 does not include all of the children whom Dr. Kanner evaluated because some of those included in the initial evaluation subsequently left Linwood and some of those included in the follow-up evaluation were not enrolled in Linwood at the time of Dr. Kanner's evaluation. The following table shows the diagnoses that were given to these children.

TABLE 3

Diagnosis of Children with One Evaluation

Diagnosis	Boys	Girls	Total
Retardation	4	1	5
Autism	4		4
Schizophrenia	2	1	3
Schizoid	1		1
Aphasic	2		2
Total	13	2	15

This group contains approximately the same kinds of diagnosis as the other group. These children left Linwood for many different reasons. Eight of these children were over eight years of age and Linwood's bias toward younger children may have influenced transfers to other institutions. Two of the autistic children were admitted to Linwood subsequent to Dr. Kanner's initial evaluation. One child wnet to the Central Institute for the Deaf because of his hearing difficulties. It is possible that Dr. Kanner's evaluations had some influence on the Linwood selections and dispositions since most of the children he diagnosed as retarded subsequently left Linwood for placement in other institutions.

Changes in Linwood Children During Treatment

This description of the changes in the children during the period of their treatment at Linwood is presented to give the reader some data on the magnitude and kinds of changes that occur. The descriptions are based on the various observations made during the project, the pre-admission data in the child's file and Dr. Kanner's reports. The dimensions of behavioral change that are reported are taken mostly from "The Instrument for Evlauating Autistic Children, " by Ruttenberg, Drattman, Fraknoi and Wenar. Data is presented separately for each child along with the diagnosis applied by Dr. Kanner. The full diagnostic report by Dr. Kanner is included as an appendix. A numerical summary of the population follows the data for the individual children.

Summaries of Linwood Children

Allen: Initial Age, 14; current age, 17: Kanner diagnosis - Autism.

RELATIONSHIP TO PEOPLE

Initial: Withdrawn and self-contained. Facts not integrated in interpersonal relationships in his tenuous contact with others. No contact with brother who also attended Linwood. Inappropriate smiling and withdrawal from physical contact.

Current: Developed ambivalent relationship with male staff member: teasing and authoritarian in giving orders. Acceptable social adjustment to public school.

COMMUNICATION

Initial: Minimal communication. Speech used impersonally. Speech immature: words poorly pronounced, repeated syllables, with high-pitched, falsetto voice.

Current: Able to discuss some abstract ideas. Shrinks from personal references: personal preferences of food, music, classes. Expresses humor in response to riddles. Uses language to express hostilities. Higher frequency of asking questions.

MASTERY OF OBJECTS

Initial: Large repository of facts; frequent sensory contact with objects such as rubbing. Simply assembly of puzzle 6-8 pieces.

Current: Able to attend public school: grades B and C. Evidences pride in knowing many facts by smiling. Draws complex pictures eith detail. Independent concentration for 30-40 minutes.

EXPRESSION OF DRIVES

Initial: Ritualistic and compulsive about being clean. Bit, and rejected food which must be chewed such as meats.

Current: Complete independent control of toileting. Bossy and assertive with less aggressive children, and is impressed by power. Eats most foods but in small amounts.

Billy: Initial age, 9; current age, 12.5; Kanner diagnosis: Hospitalism Syndrome.

RELATIONSHIP TO PEOPLE

Initial: Guarded and suspicious; withdrawn with no eye contact.

Current: Complex relationship with peers structured by adult group therapy: consistent involvement and frequent verbal fluency. Adequate social adjustment to public school.

COMMUNICATION

Initial: Meager communication; some speech in answer to direct questions or as requests.

Current: Able to carry on sustained conversation without ideational scattering. Verbal fluency with somewhat mechanical inflection; language to express ideas, information and comments. Some expression of feelings.

MASTERY OF OBJECTS

Initial: Highly active with brief attention span. Assembles complex puzzles of 15-20 pieces.

Current: Frequently sustains attention for 40-60 minutes. Completes public school work successfully in all subjects.

EXPRESSION OF DRIVES

Initial: Bizarre fears (sunlight). Intense tantrums.

Current: Occasional oral and facial tics in social situations. Decrease in fears. Challenges authority and is assertive with familiar adults.

Brad: Initial age 6; current age 9.5; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: No contact with people; no cognizance of presence of people. Shrank from physical contact and had no eye contact.

Current: Intent visual and manual exploration of faces. Contact with people partially realistic and partially infantile teasing. Occasionally interacts physically with other children. Good eye contact with peers and adults.

COMMUNICATION

Initial: No response to verbal address; mute.

Current: Echolalia; limited but frequent spontaneous vocalizing: some gibberish. Some speech for requests. Follows verbal instructions. Occasional speech in phrases: "Tie my shoe," appropriately.

MASTERY OF OBJECTS

Initial: Spinning objects with skill; no handedness; simple assembly of objects. Stacking 3-4 blocks.

Current: Matches four basic colors and four animal pictures on teaching machine with cards at table. Matches geometric shapes. Completes puzzles of 10-15 pieces. Cuts with scissors.

EXPRESSION OF DRIVES

Initial: Not toilet trained. Obsessive food habits. Frequent tantrums: throwing self on floor and biting hand. Poor sleep.

Current: Some toilet training accomplished. Decrease in tantrums. Eats greater variety of foods such as apples, crackers, marshmallows, potato chips, raisin bread, pretzels, oranges, ice cream.

Dan: Initial age, 9; current age 13.5; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Severe withdrawal. No eye contact.

Current: Responds to mutuality such as toss games with big ball or guitar lessons. Engages more frequently in activities with peers such as group exercises.

COMMUNICATION

Initial: Used language for information such as names of people and dates. Frequent use of gibberish with manic delivery.

Current: Reads fluently; writing is sloppy because he doesn't think it's important for communication. He converses normally except for occasional irrelevant comments with hyperactive body movements. Speech is increasingly spontaneous. He frequently initiates conversations.

MASTERY OF OBJECTS

Initial: Avoided contact and activity with objects. He didn't use his hands except for "twirling." Physically passive.

Current: Reads fluently at 6th grade level. Works algebra at 7th-8th grade level with gaps at 4th and 5th level of skills. Uses microscope effectively. Rapid and accurate spelling. Learned to play guitar. Climbs jungle gym with adult encouragement.

EXPRESSION OF DRIVES

Initial: Compulsive: twirling a stick, remembering licence plates of cars frequently parked at center, birthdays, telephone numbers.

Current: Decrease in frequency of twirling and is able to leave "twirler" for increasing periods of time. Occasionally exhibits self-defense by hitting back.

David: Initial age 6 ; current age 10; Kanner Diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Shunned physical contact. Self-isolation

Current: Frequently approaches peers and touches faces.

COMMUNICATION

Initial: Some early speech development. Regression with no language.

Current: Names objects while looking through picture books. Spontaneous speech with some intonation. Frequently initiates verbal contact with verbal peers.

MASTERY OF OBJECTS

Initial: Ritualistic; compulsive: wouldn't leave bus until adult said "good-bye."

Current: Associates abstract symbols in adding and subtracting through 8. Reads at 2nd grade level. Attention span increased. Able to sustain interest in activity for 10-15 minutes.

EXPRESSION OF DRIVES

Initial: Frequent rocking. Head banging. Screamed constantly.

Current: Aggression by hitting which is more appropriately directed, e.g., when a child takes an object from him. Accepts nearly all foods.

Dorothy: Initial age 3; current age 5.5; Kanner diagnosis: an adequate category was not found.

RELATIONSHIP TO PEOPLE

Initial: Accepted physical contact. Little facial evidence of feelings.

Current: Seeks adult attention and can share. Enjoys physical contact in cuddling.

COMMUNICATION

Initial: Able to comply with verbal requests. Some vocalizing with voice inflection. No speech.

Current: Speech: echolalia. Increase in spontaneous speech and speech is clear and understandable.

MASTERY OF OBJECTS

Initial: Compulsive possession of objects such as rocks or a piece of wood. Simple assembly of objects: stacking 3-4 blocks. Frequent sensory exploration by rubbing.

Current: Sustained interest: matches pictures, sewing cards, completes graduated cylinders. Occasionally engages in imaginative play when encouraged by other child. Able to release selected object such as rock or wood for longer times. Dresses and undresses self.

EXPRESSION OF DRIVES

Initial: Self-destructive: striking her head, frequent tantrums, hair pulling and crying. Not toilet trained. Thumb-sucking. Compulsive attachment to blanket.

Current: No current attachment to blanket. Toilets independently. Occasional hitting: more controlled for attention than feeling. Aggression is more verbal expressed by, "Don't do that," "Go away."

Ellen: Initial age 4; current age 7; Kanner diagnosis: Oppositional Syndrome.

RELATIONSHIP TO PEOPLE

Initial: Manipulative and negativistic to the exclusion of other relationships.

Current: Able to cooperate in activity on terms set by adult. Sustained eye contact; less manipulative. Attention-getting behavior directed at adults not peers.

COMMUNICATION

Initial: Normal speech used primarily for requests and commands.

Current: Frequently initiates conversations and can sustain long conversations to share ideas and feelings. Verbalizes about past and future.

MASTERY OF OBJECTS

Initial: Able to combine objects: 10-15 piece puzzle.

Current: Attends public Kindergarten; performs at age level. Initiates imaginative play.

EXPRESSION OF DRIVES

Initial: Self-destructive. Frequent tantrums; rage response to frustration.

Current: Manages toileting independently. Tantrums less frequent and less intense. Food preferences, but accepts wide variety.

Garth: Initial age 9; current age 12; Kanner diagnosis: Postencephalitic condition.

RELATIONSHIP TO PEOPLE

Initial: Intermittent imperviousness to others: tightly pressed eyes with hands.

Current: Sustains physical contact with familiar adult: leans against them while coloring or drawing.

COMMUNICATION

Initial: Verbalizing in reversed speech. Occasionally gave factual answers to direct questions. Used speech to control contact with people.

Current: High frequency of vocalizing to accompany an activity. Complies with verbal requests.

MASTERY OF OBJECTS

Initial: Definite hand preference. Unable to perform in structured test situation. Copies pictures accurately.

Current: Able to sustain schoolroom activities for 30-40 minutes. Adds and subtracts.

EXPRESSION OF DRIVES

Initial: Frequent tantrums when angry.

Current: More able to express anger verbally.

Gerald: Initial age 4; current age 5; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: No eye contact or awareness of people. Resisted physical contact by becoming rigid.

Current: Brief eye contact. Delight in mutual activity of ball throwing or vigorous physical plsy indicated by laughing and jumping. Initiates physical closeness: carried and placed chair near familiar adult; aggressive behavior by hitting. Responds to physical contact by laughing.

COMMUNICATION

Initial: No form of communication; loud and frequent screaming with no variation.

Current: Gibberish which includes vowels and consonants and varied intonation; vocalization includes greater modulation. Laughs Responds to requests from familiar adult such as "Come here," or "Turn on the water." Decreased crying; crying used as a request sometimes combined with pulling on an adult.

MASTERY OF OBJECTS

Initial: Intense and prolonged preoccupation with spinning objects; ritualistic behavior such as tapping objects against his mouth and beating the back of his hands together. Whistling. Fine motor coordination better than gross.

Current: Whistles a familiar tune. Able to learn sequence by observing a repeated operation of a top, unfamiliar toy, and duplicated procedure. Can sustain an activity: painting up to 15 minutes without adult prompts. Able to assemble separate objects to function properly such as 4-5 piece gear toy. Can assemble graduated cylinders properly. Feeds himself with a spoon.

EXPRESSION OF DRIVES

Initial: Not toilet trained; self-destructive: head banging; frequent rocking motions. Frequent and loud screaming with little variation. No interest in food but would drink.

Current: Decrease in head-banging; hits back when angry; crying with frustration or pain. Eats many foods such as sandwiches, soup, fruit.

Grant: Initial age 5.5; current age 7; Kanner diagnosis: Schizophrenia

RELATIONSHIP TO PEOPLE

Initial: Withdrawn. Persistent and frequent attempts to escape from Linwood and personal contact. No eye contact.

Current: Tolerates presence of people. Brief eye contact. Significant decrease in running away.

COMMUNICATION

Initial: Some speech such as "good-bye," or random words not appropriately associated with an activity or a person. No response to verbal requests.

Current: Frequently complies with verbal requests. Vocabulary comparable to first grade level. Increase in frequency of spontaneous speech.

MASTERY OF OBJECTS

Initial: Low inclination to handle objects. Assembles simple 5-6 piece puzzle with sustained adult support.

Current: Uses objects for appropriate function: assembles designs with a pegboard. Writes and spells at first grade level.

EXPRESSION OF DRIVES

Initial: Resisted eating and drinking: hospitalized for dehydration. Frequently ran away. No toilet training.

Current: Manages toileting independently. Decrease in escape behavior. Decrease in resistance to foods.

Hal: Initial age 8; current age 11.9; Kanner diagnosis: Retardation.

RELATIONSHIP TO PEOPLE

Initial: Tolerates people: no withdrawal or resistance; capable of some automatic obedience. Aware of adults. No compliance to verbal requests.

Current: Occasionally participates in group activities. Evidences fear of aggressive children by withdrawal. Direct eye contact. Closes eyes and covers ears when doesn't want to follow directions.

COMMUNICATIONS

Initial: No intelligible speech; occasional noises to accompany pleasure.

Current: Communicates through variety of sounds and pulling hand of adult.

MASTERY OF OBJECTS

Initial: Able to handle very simple form boards; replace graduated cylinders properly; dress and undress with minimal prompting. Frequent wandering with very brief attention span.

Current: Manages coloring and cutting with scissors. Able to assemble 6-8 tinker toys. Moves in rhythm to music. Decrease in wandering. Can sustain an activity for 5-10 minutes with less adult prompting.

EXPRESSION OF DRIVES

Initial: Frequent tantrums and crying. No toilet training. Compulsive eating, particularly candy.

Current: Decrease in frequency of tantrums. Will toilet independently with adult prompt. Cries and laughs appropriately.

Jackie: Initial age 8; current age 11; Kanner diagnosis: Autism

RELATIONSHIP TO PEOPLE

Initial: Aloneness; oblivious to people.

Current: Reasonably comfortable with people. Doesn't attempt to escape from people. Complies with suggestions and requests. Increase in eye contact.

COMMUNICATION

Initial: Mechanical verbal behavior; speech had "recorded" sound. Frequent echolalia.

Current: Answers questions readily. Amenable to some degree of amusement and can respond to humor. Speech has less mechanical intonation. Frequently complies with verbal requests.

MASTERY OF OBJECTS

Initial: Completes an intricate jigsaw puzzle guided by shape of pieces rather than content of picture. Compulsive repeated assembly of a puzzle until he was interrupted.

Current: Scholastic achievement at third grade level.

EXPRESSION OF DRIVES

Initial: Compulsive such as obsession with TV commercials. Violent temper tantrums when frustrated.

Current: Frequently verbalizes frustrations; less disrupted by changes in routine.

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__Jerry__: Initial age 8; current age 11; Kanner diagnosis: Global Schizophrenia

RELATIONSHIP TO PEOPLE

Initial: Passive and facile acceptance of physical closeness but no reciprocity. Didn't resist cuddling. Could be engaged in play with adult on primitive level in running and chasing.

Current: Evidence of aggression by some biting, occasionally pushing a child. Occasionally expresses resistance in loud sounds and physical withdrawal. Initiates tesing: occasionally chasing and pulling on an adult. Indications of reciprocity: followed child in activity, touching same toys and smiling, which was sustained for 5 minutes.

COMMUNICATION

Initial: No vocalization. Would comply with verbal requests.

Current: No speech, but emits sounds for help. Claps hands to indicate yes and no. Has been observed silently mouthing words to a record.

MASTERY OF OBJECTS

Initial: Able to integrate objects; placing graduated rings in proper sequence. No perseveration.

Current: Able to complete task: puzzle, coloring a picture, but interest is only sustained by adult support.

EXPRESSION OF DRIVES

Initial: Not toilet trained. Mouthing and sucking of hand, adult's cheek.

Current: Reluctance to eat. Expresses frustration in tasks by cry, such as when puzzle piece doesn't fit.

__Karen__: Initial age 3; current age 6.5; Kanner diagnosis: Features of Autism.

RELATIONSHIP TO PEOPLE

Initial: Oblivious to people; no eye contact.

Current: Explores children and adults visually, manually, and frequently. Frequently initiates an activity with adults and other children. Sustains productive interpersonal activities for as much as 15 minutes. Teases, expressed by poking and chasing adults and children. Regularly responds to requests and suggestions from a familiar person.

COMMUNICATION

Initial: Mute; non-speech communication was meager. Crying was undifferentiated and constant: manifestation of crude primitive affect.

Current: Frequently exerts tremendous effort towards speech. Intently observes the speaker and imitates facial postures. Names many objects, but articulation is not exact. Able to effect the listener; naming objects, requests. Crying is differentiated and reflects anger, frustration and pain.

MASTERY OF OBJECTS

Initial: Avoided contact: didn't pick up objects or touch surfaces; completely passive with physical environment.

Current: Still evidences passive receptive stage by using people's hands for assistance. Manages dressing routine independently and can zip and button. Association of symbols with concrete objects indicates the emergence of secondary processes: searches for lotto picture of fish to match word fish served for meal. Assembles puzzles of 6-10 pieces.

EXPRESSION OF DRIVES

Initial: Crying was amorphous and undifferentiated. Reluctance to chew or swallow by holding food in mouth. Not toilet'trained.

Current: Moved through stage of active biting and messing; playing with food. Accepts increasing variety of foods. Toilets independently; undresses, identifies needs, communicates need.

Ken: Initial age 5; current age 11; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Avoided people: intense fear of strangers with an attempt to escape. No eye contact.

Current: Greater need for people: spontaneously identified, verbally and physically, a familiar staff person. Tolerates physical contact and has brief but frequent eye contact.

COMMUNICATION

Initial: Frequent echolalia. Echolalic pronunciations clearer than other speech forms. Names objects. High-pitched voice. Speech not intended for communication. Injects "da-da-da-da-de" between echolaic expressions.

Current: Decrease in echolalia. Two to three word replies in answer to direct question. Sings familiar song accurately.

MASTERY OF OBJECTS

Initial: Complete simple puzzles of 8-10 pieces.

Current: Completes complex design with cos blocks and peg boards.

EXPRESSION OF DRIVES

Initial: Intense fears such as leaving home, glass, strangers. Food capriciousness. Withheld feces. Self-destructive: head banging and choking self and others.

Current: Decrease in self-destructiveness and no head banging. Good independent bladder and sphincter control.

Kent:[1] Initial age 4; current age 6.5, Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Aware of people but unresponsive; tolerated physical contact.

Current: Frequently initiates physical contact with familiar adult. High frequency of smiling and jumping as an indication of pleasure. Occasionally joins group activity such as circle games and ball throwing.

COMMUNICATION

Initial: Occasional babbling. No speech. No response to verbal requests.

Current: Frequent vocalization with variety of sounds and intonations. Frequently, spontaneously, and accurately reproduces 5-6 tunes.

MASTERY OF OBJECTS

Initial: Mostly passive. Compulsive and perseverative play with string.

Current: Frequently sustained activity with objects: block towers and form boards. Selects various objects and combines for preconceived purposes such as collecting 10 blue soldiers to put on block tower.

EXPRESSION OF DRIVES

Initial: No sphincter control. Tantrums. Frequent crying. Periods of refusal to eat.

Current: Undresses to nudity with evident delight. Decrease in crying. Frequent acceptance of variety of foods: meat, potatoes, ice cream, jello.

Les: Initial age 2; current age 4; Kanner diagnosis: Autism

RELATIONSHIP TO PEOPLE

Initial: No eye contact. "Angry" demeanor with frequent frown. Withdrawn.

Current: Eye contact. Initiates physical contact. Related in primitive way: sits in lap, babbles, and handles face of adult. Differentiates between (goes to) people. New degree of negativism: will push back when pushed. Smiles and vocalizes in presence of familiar adult.

COMMUNICATION

Initial: No speech; constant crying with little variety: undirected expression.

Current: More frequent vocalizing; said "water" with clarity in dining room. Smiles and laughs with certain activities such as ball throwing.

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[1] Chapter 8 contains a complete case study of Kent.

MASTERY OF OBJECTS

Initial: Preoccupation with spinning objects; intensely engrossed with toys like trains that moved.

Current: Assembles simple puzzles. Paints and colors. Handles spoon for eating and serves himself additional food.

EXPRESSION OF DRIVES

Initial: Not toilet trained. Constant crying and screaming with no tears and little intonation; crying not related to awareness of people or events. Ate only baby foods and crackers and refused other foods.

Current: Soils occasionally. Eats almost all foods served. Cries infrequently for expressing pain, anger, frustration.

Mark: Initial age 3; current age 6.5; Kanner diagnosis: Autism

RELATIONSHIP TO PEOPLE

Initial: Physical withdrawal from touch. No eye contact.

Current: Anticipates approval of familiar person. Able to conform to adult terms for period of time. Frequently directs attention to an activity he's involved in: drawing a picture, completing a puzzle, writing numbers.

COMMUNICATION

Initial: Non-reactive to verbal behavior. Some naming: preoccupied with letters and numbers but no intent to affect listener.

Current: Uses speech for requests, manipulation of people, and to communicate ideas. Frequently initiates verbal contact.

MASTERY OF OBJECTS

Initial: Sensory exploration: autoerotic gratification rather than concern with function of object.

Current: Able to sustain goal-directed activity, e.g., completion of puzzle map of United States. Reading at 1st grade level with some gaps in comprehension. Integrates number of objects with varied functions; cuts paper with scissors; applies paste; combines several pieces in picture. Knows all colors.

EXPRESSION OF DRIVES

Initial: Accepts very limited foods such as only sugar on bread slice. Intense tantrums; frequent throwing of blocks and toys.

Current: Manages toileting independently and needs no prompts. Handles clothing including zipping. Infrequent throwing behavior. Eats variety of foods (toast, fruits, cheese, ice cream, jello, fish sticks, peanut butter, etc.).

Chapter 10

Phil: Initial age 6; current age 11.9; Kanner diagnosis: Schizophrenia

RELATIONSHIP TO PEOPLE

Initial: Unrelated and inaccessible to people.
Current: Frequently seeks contact with people. Speaks socially.

COMMUNICATION

Initial: Echolalia
Current: Initiates verbal contacts for requests, information, and to sustain adult attention.

MASTERY OF OBJECTS

Initial: Moderately related to objects: sensory exploration of objects rather than functional use: hyperkinetic; brief attention span.
Current: Sustains interest in drawing or assembling puzzle for 10-15 minutes.

EXPRESSION OF DRIVES

Initial: Wet and soiled indiscriminately. Hyperkinetic. Destructive.
Current: Adequate sphincter control; toilets without adult prompts and manages clothing independently. Verbalizes anger and frustration.

Sandy: Initial age 9; current age 12; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Inappropriate smiling and withdrawn from people.
Current: Participates frequently in group activities. Good eye contact. Aggressive and encourages peers verbally to misbehave (tear up worksheet).

COMMUNICATION

Initial: Speech: able to accurately express a request. A high frequency of non-communication speech. Frequent repetition of senseless sentences infinite number of times; noises similar to explosions and singing sounds.
Current: Frequent questioning of adults; answers direct questions. Decrease in non-communicative vocalizing.

MASTERY OF OBJECTS

Initial: Poor muscle tone; hardly able to hold pencil or kick. Little interest in any object. Sporadic, diffuse and brief attention span.
Current: Reads at first grade level; above second grade level in phonics and spelling; adds and subtracts on semi-concrete level through 4; the quantity of work has increased. Can write his name and copy sentences accurately.

EXPRESSION OF DRIVES

Initial: Destructive: frequent tearing of books and folders. Frequent masturbation. Overactive. Constant motion of hands, head, feet. "Hand washing" mannerism. Compulsive about location of personal belongings.

Current: Increase in verbal aggression ("I'll throw my boots.") and less hitting. Decrease in tearing behaviors.

Tammy: Initial age 7; current age 10; Kanner diagnosis: Autism.

RELATIONSHIP TO PEOPLE

Initial: Fleeting and brief eye contact. Lack of response to verbal requests. Withdrew from physical contact.

Current: Frequently initiates contact with children and adults using proper names. Communicates requests and asks for information.

COMMUNICATION

Initial: All speech situations are present but a high frequency of echolalia preempts them: proper sentence formation, natural interaction. Spontaneous speech only with requests for objects. Disregards verbal requests from adults.

Current: Decrease in echolalia.

MASTERY OF OBJECTS

Initial: Compulsive behavior such as flushing toilets. Able to write and copy letters and numbers accurately. Well organized reproduction of people in drawings. Independent activities sustained only briefly.

Current: Able to sustain activity independently for 20-30 minutes.

EXPRESSION OF DRIVES

Initial: Frequent temper tantrums when frustrated and angry.

Current: Increase in use of speech to express anger and frustration. Frequent use of "toilet talk."

Tina: Initial age 3; current age 5; Kanner diagnosis: Infantile Autism

RELATIONSHIP TO PEOPLE

Initial: Aloof; withdrew from physical contact.

Current: Evidences negativism by verbalizing "no." Able to make personal contact but demands many compromises from the other person such as in the selection of toys. Success in a task is occasion for looking at adult for approval. Displays emotion when another child cries and gives comfort physically and verbally.

COMMUNICATION

Initial: Constant, inconsolable crying. Echolalia. No response to verbal requests.

Current: Crying now infrequent but is used to express frustration, pain, and anger. Uses speech for requests and to express ideas. Developing reading; sounds words phonetically.

MASTERY OF OBJECTS

Initial: Obsessive interest in objects with repetitious performances such as completing and dumping form board until adult terminated activity. Hyperactive.

Current: Handedness established. Knows colors. Identified numbers to 10 and places in order. Associates various objects: requests key to unlock cabinet to obtain game. Frequently sustains an activity for 15-20 minutes. Imaginative play by "dress-up" and "playing house." Cuts with scissors.

EXPRESSION OF DRIVES

Initial: Constant crying. Not toilet trained. Bizarre attachments such as sleeping with 2 vegetable cans.

Current: When frustrated turns away or to another task. Independently manages toileting: communicates need, dresses and undresses. Occasionally screams when frustrated. Asks for help verbally with prompt.

Tod: Initial age 5; current age 8.5; Kanner diagnosis: Retardation.

RELATIONSHIP TO PEOPLE

Initial: Indicates fear by withdrawal from people. Frequent wandering from people.

Current: Comfortable with people. Frequently seeks physical contact.

COMMUNICATION

Initial: No speech; frequent loud, unpleasant noises. No response to verbal requests.

Current: Frequently and accurately complies with verbal requests. No speech. Communicates ideas with hand signals, by pulling adult and vocalizing; increase in variety of sounds such as "mo-mo," "ut."

MASTERY OF OBJECTS

Initial: Compulsive: door-slamming obsession. No handedness. Able to complete form board of 12 pieces. Needed constant adult support to sustain activity.

Current: Able to assemble 10-15 tinker-toys with some adult support. Buttons and unbuttons, zips, dresses and undresses without help. Matches colors and shapes. Completes puzzles of 10-12 pieces.

EXPRESSION OF DRIVES

Initial: No fecal control. Frequent hand-biting which developed callouses. Frequent crying. Strong resistance to change. Resists water and bathing.

Current: Toilets independently. Cries infrequently. Decrease in hand biting. Increase in vocalizing when frustrated with occasional screaming.

Table 4 summarizes the development of all of the children without reference to diagnosis. Once again the categories are taken from the "Instrument for Evaluating Autistic Children" by Ruttenberg et al., as are most of the specific stages of development within each of the categories.

TABLE 4

Summary of Children's Development During Treatment at Linwood Based on Categories from the Instrument for Evaluating Autistic Children by Ruttenberg, Drattman, Fraknoi, and Wenar

I. Relationship and Degree of Relationship to an Adult as a Person:	Numbers of Children	
	Initial	Follow-up
1. Impervious or oblivious	5	
2. Withdrawal or intermittent imperviousness	14	
3. Resistiveness	1	
4. Visually attends a familiar person at a distance		
5. Brief, sporadic attending familiar person in proximity - physical	3	7
6. Regularly recurring response to one person as a whole		7
7. Consistent searching out and attending one person for comfort, approval, help, play.		
8. Anticipates approval and disapproval.		
9. Sharing of experiences - mutuality.		7
10. Identification and empathy		2
II. Communication:		
1. No communication	8	
2. Undirected expression of distress	3	
3. Signs of directing requests - need oriented		
4. Direct approach for help or attention		
5. Regular and varied pattern of approach - pleasure in engaging and controlling others; vocalization.		7
6. Verbal communication is included as a component of action: a. Echolalia	5	1
b. Naming	4	1
c. Requests	3	5
d. Expression of ideas & feelings		7
7. Communicates memories and fantasies; getting away from concrete here and now		
8. Pleasure and mutuality in communication		2

Table 4 (cont'd)

	Initial	Follow-up
III. Drive for Mastery:		
1. No interest or effort at mastery	2	
2. Sensory exploration	4	
3. Undifferentiated manipulation	6	
4. Intensive and varied manipulation of few objects.	9	3
5. Intensive manipulation of a number of objects.		2
6. Combines few objects as functional unit.		4
7. Selection and integration of number of objects; seeking out objects to complete integration	2	3
8. Carries out sequence of goal-directed actions from preconceived plan.		3
9. Carries out comples sequence with experimentation and improvisation.		4
10. Spontaneous creativity		4
IV. Expression of Instinctual Drives:		
1. "Pre-oral" and Oral stages.	20	3
a. Component drives - objectless rage, screaming with no intent to communicate. Rhythmic movements, touching and feeling textures, etc.		
b. Oral sucking stage - mouthing, perseverative drinking or eating.		
c. Oral biting stage - pica, chewing indiscriminately, refusal to chew anything		
2. Anal stage.	2	14
a. Expulsive - destructive motor discharge, tantrums, limpness, pleasure in feces.		
b. Retentive - withholding feces, avoiding messiness, extreme stubbornnes, etc.		
3. Phallic stages.		1
a. Interest in phallus, narcissistic interest in nakedness.		
4. Ego modifications.	1	5
a. Oral traits		
b. Food idiosyncrasies, demanding		
c. Anal traits - ritualistic, manipulating, resistive, imposition of power.		
d. Phallic traits - assertive, fears of dark, challenges authority.		
e. Healthy sublimation - school, imaginative play.		

Each child is entered only once in each scale to indicate the furtherest development achieved in that category. Thus in the area of relatedness the child furtherest developed no further than brief and infrequent attention to a familiar person who was nearby. At the end of the evaluation period, the least developed children had achieved this level and 16 others had exceeded it.

The initial level of communication in the group was quite varied with one half of the group with little ability or disposition to communicate and the rest quite a bit further along in the verbal development. The progress from the lower and the continuum probably consists of behaviors which are very similar to the performances described in the relatedness profile, for example, the 7th stage in the relationship continuum and the 4th stage of the communication. The later stages of development, however, although interdependent, represent different kinds of conduct. The bi-modal distribution of the children in the development of communication reflects the retarded and brain-damaged children who do not develop verbally as much as autistic children, as may be seen from the initial and follow-up evaluation of the individual children. The "Drive for Mastery" development is similar to that of "Communication." Many of the children, mostly diagnosed retarded by Kanner, show only small advancement. The area of "Instinctual Drives" describing elimination and oral habits and sexual development show marked development for all children. Initially none of the children had sphincter control. At the time of the second evaluation three of the children still had attained no control, six had frequent control and fourteen attained independent control.

REFERENCE

Ruttenberg, Bertram, Drattman, Mitchell L., Fraknoi, Julia, and Wenar, Charles. An Instrument for Evaluating Autistic Children. J. of the Amer. Acad. of Child Psychiatry, Vol 5, July 1966.

CHAPTER 10

APPENDIX

Part 1

Evaluations of Linwood Children by Dr. Leo Kanner (Initial and Follow-up Evaluations)

Allen December 12, 1966

This 15 year old boy has been at the Linwood Center for the past approximately 6 1/2 years. He was very withdrawn at first and had very little communication. In the course of his stay here, he has improved to an extent that makes it possible for him now to attend the nearby junior high school. He has a large repository of factual knowledge and at the mention of Vietnam, for instance, was able to draw a map of North and South Vietnam, Laos and Cambodia. He knew the capitals of many countries and could name the countries through which the Danube River flows. He knew the dates of the Civil War and seemed comfortable in answering all those questions. He s-emed really to enjoy the questions connected with the so-called absurdity test and promptly recognized the absurdities. He was able to define abstract terms, such as pity, revenge, and jealousy, and on special questioning even was able to tell that he had been jealous, though he would not go into any detail.

Things were different when it came to things involving his personal feelings. When dropped on a desert island and allowed to take one person along with him, he would take a person whom he likes but could not name anyone in particular. There was nobody at home or at school whom he liked best. When asked who he liked best, he referred to himself but could not name anyone whom he likes next best.

He was able to say that he did some day-dreaming which at times was pleasant and at times unpleasant but would not disclose any contents. He said that he had some ideas as to what he wants to do in the future but again would not specify. When asked how he would feel about going into the service when he reaches the age, he said that he doubted whether he would be accepted, referring to his thinness and saying that this was the only reason.

This boy is emerging to some extent from a more severe autistic condition. He is still very self-contained and leads a private life from which he excludes other people. However, along with it he is able to function sufficiently to attend school. His contact with people is tenuous but still, with definite reservations that he makes, can carry on a conversation about things which are not emotionally loaded. His world is still static, in that he is unable to make concessions and his world is filled with facts which are not integrated into interpersonal relationships. He knows, of course, that his younger brother is also at Linwood and seems to have some strong feelings about this. He has no real contact with Sammy and has spoken to him "rarely." While he thinks he "may" go home next year, he does not think that Sammy will be ready to do so and, it seems, would not cherish the idea anyway. At that, he is making scholastic progress and this may be a wedge to further reaching out into living with people.

April 22, 1968

Allen has done well in school, his last report card has B's and C's, and all the data concerning behavior--courtesy, respect for property, and all that--he has good marks. He has quite a store of knowledge, he has his preoccupations with certain data. He is quite impressed by power; he had no friends; he has formed a peculiar type of relationship with one of the male members of the staff whom he teases, whom he orders around, whom he treats as if Allen were the teacher and the other person were the pupil. It is a rather ambivalent relationship with which he is quite preoccupied and doesn't quite know what to do with. He feels that he is ready to enter regular class in the Montgomery County Public Schools. The head of the personnel department is aware of him and is a man who can give a great deal of help to the teacher. At the same time, he is now receiving individual psychotherapy from a local psychiatrist and it may be possible for the psychiatrist to help him to discuss his own personal matters more intimately than he has been abel to do so far. He shrinks from any kind of commitment about anything, about covering a subject in school, about preference of food, about preference of anything. He is a serious minded person on the whole, though I was glad to notice that he has developed a sense of humor in the sense of appreciating some answers to riddles which he did not provide but was rather quickly surprised by the unexpected action. I think he will need continued therapy over a long period of time but it is good to know that this is a child who started out with a very severe disturbance and has been able to be accessible to the kind of help that made it possible for him to be a good student and to go from here to regular school. It would be interesting to see this boy after a year or two and see how he is progressing.

Billy December 19, 1966

This 11 year old boy was adopted by Col. and Mrs. O'Clock, taken out of a large German orphanage at the age of 10 months. The father is described as a person who seems to be incapable of forming warm relationships; the mother is described as tense. In his early days the child is reported as intolerant of changes in his environment and as having "strange fears." When he started in school, he did not associate with the other children. Little is known of whereabouts and specific details until he came to the Linwood Center at the age of seven years. At one time he is said to have been examined and the Rorschach test was supposed to characterize him as a psychotic child.

Chapter 10
Appendix - Part 1.

When seen today, as soon as he came in he wanted to know where he was going to sit. He sat down in the chair assigned to him, told me that he had inquired of another boy what was going to be said to him and was told that he would be asked for his age. When he noticed the number 11 behind his name on my sheet, he wondered why I was interested in ages.

While he answered every question, he was extremely guarded and avoided specific answers by remarks such as, "various things" or "I'm not sure." He considered himself as "fairly healthy," reminded me that he had asthma because he was "allergic to my own sinuses." He was not sure whether he was bright, mentioned something about problems of reading and writing. He said that he had friends but could not name any one friend, let alone a best friend. He was not fully satisfied with either father or mother but would not go beyond this. Sometimes he got mad at his mother and used his fists. He was not sure what he wanted to do when he grew up and after some urging decided he wanted to be a scientist, exploring things.

When asked his three wishes, he only had one, namely, that when things were too hard he wanted them easier for him. Again this is as far as he would go.

There is a statement in the history that his mother felt that he was clinging to her and that for some time, probably while abroad, he was sleeping with his parents. It is pretty hard to tell whose suggestion that was.

The chief impression one has is of a child who is utterly not sure of himself. He has asked questions about his real origin, pointing out to me that he asked his mother but neither she nor he remembered the names of the real parents. He asked me once why I was writing down things and on the surface seemed satisfied when I told him that I did so in order to remember things.

All the way through, you could not obtain any positive answer one way or the other about his feelings. He seemed guarded and a bit suspicious. One wonders about his earliest experiences in the orphanage. His relationship to people is reminiscent of the "hospitalism" cases described by Goldfarb, Spitz, Bowbley and others. I don't think that this child is capable of any real, genuine attachments. About himself, he is neither positive nor negative in any particular direction. I did not see, during the interview, any tics or any compulsiveness.

Diagnostically, I see his general personality as related more to the hospitalism syndrome than to any other category.

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April 29, 1968

Billy whom I saw about a year and a half ago has in many ways made progress of which the Linwood Center as well as the public school which he now attends, can be really proud. In his interview today, he showed very good formal behavior, talked about things almost philosophically and in some areas carried on a sustained continuous conversation without any sign of ideational scattering. He has attended school since September. I saw his report card which reports good progress in all subjects. This means so much more if we realize that this is the first formal school experience. The report says that he gets along well with the other children in the school, I don't believe that he has any close contact with any of them, but has formed some tenuous relationships with two children at the Linwood Center. He has become philosophically tolerant of people and the world at large; he was able to say that he did not know of any one perfect. When I suggested the diety, he wondered whether even the diety is perfect because there is so much poverty and misery and illness in the world. He will remain at Linwood for, at least, another year and I don't think anything better could have happened to this child in the first place than being here for the last few years. During the conversation he was rather tense and this came out in the presence of quite a few labial and generally oral tics and facial tics which I am told do not occur often. Of course, to this curious child, the interview was a very special occurrence. I learned from him that he remembered quite a few special items of our meeting about a year and a half ago and that he has come home and reported some of this to his mother, so that it is possible that the tics were a little more exaggerated than usual because of the seriousness that he gave to this special occasion.

Brad October 24, 1966

Having known Brad since the age of not quite three years (Brad is now almost exactly eight years old), I see at the time of this visit a remarkable change in his behavior even though some basic features are still in evidence. In the first approximately four years of my acquaintance with him, he had no contact with people. There definitely was no eye contact; when he came to my office, he would run around without giving any sort of positive or negative cognizance of my presence, would immediately go after objects, open and close doors, not respond to any form of verbal address and would shrink from physical contact. He would spot a round ashtray and spin it with considerable skill.

When he was led in by Miss Simons today, he sat down in the chair opposite me across the table and at first spent quite some time looking intently at me. Even when trying to fit forms into the form board or cylinders into the cylinder board, he still took time out either to look at me or to look into space, returning to his task at Miss Simons's gentle invitation. He used either hand indiscriminately, guided mostly by the prosimity of the object to either hand. When the form boards were removed, I started playing with him in the manner that one would with a two or three year old. He responded to this promptly and with pleasure. Even in the form board situation, he on one occasion seemed pleased with the performance to the point that he said, "That's good." After some persuasion, more so on the part of Miss Simons, he played with me with one of the educational toys (a ring tower kind of toy) and got the idea of taking turns. When I was remiss, he would guide my hand to the ring when it was my turn. One of the rings fell down on the floor and at request, he picked it up. We continued playing, putting our foreheads together and again he enjoyed this very much, at times opening his eyes wide and expecting me to do likewise, which I did. He often held my hand, sometimes gently, sometimes squeezing it. A few times he did wave some of the toys very close before me but never to the point of touching or hitting me. There was definitely mutuality in the relationship and it seemed as though he did some "operant conditioning" on his part with me.

I understand that toilet training has been accomplished by this time with some infrequent and erratic instances. He still has some obsessive food habits but there has been a mild improvement. Joining the other children in food intake is one of the few signs of entering into group activity. He has on occasions used one other child to satisfy his own compulsive needs. Mrs. Nash's examination shows him to be a child whose performances would not transcend the two-year level (even though his handling of the form board goes somewhat beyond that). If one had not followed his development, it would be possible to conclude that we deal with a severely retarded child. However, the early history of complete self-isolation and compulsive behavior indicates that he shows signs of a slow emergence from both. There is no cause for being sangfroid and the further progress may be very slow and reach a level that would not quite fit him to social living. Nevertheless, there has been some emergence and his behavior gives one the impression that he has stored up verbal and other means of communication, which are beginning to come to the fore. I was particularly impressed by the way in which he rewarded me for playing with him by a kind of "speech," which was essentially a pleasant and pleased utterance of "badabadabada." I may add that on one occasion while working with the form boards, he hummed some tunes, and on another occasion spontaneously started a song, in which a bit of "Old McDonald Had a Farm" could be recognized.

On the basis of the history and today's performance, I would not hesitate to consider Uen as an autistic child with some degree of at least a partial emergence.

April 22, 1968

Brad, now 9 1/2 years old, would, if we depended entirely on psychometric measurement, not go beyond the four-year level. Since the last evaluation, about a year and a half ago, he has been doing quite a bit of echolalia more than then, and has also indulged in very limited spontaneous speech; some of it in terms of gibberish. The main feature is that he has very little sense of himself in relation to the world of people. He has tried to have some kind of concept with people which is partially realistic and partially in an infantile teasing way. I should say, that while this child has shown some additional signs of partial emergence, that basically he is still a very sick, psychotic child, and the prognostic assessment made a year and a half ago still stands. I think now the teacher and everybody else is concerned that no thought of living on his own can be anticipated and this child will need a sheltered environment for the future. Meanwhile, I don't think that anything better can be done for him than retaining him at the Linwood Children's Center with the hope of somewhat better formal relationship with humans and affective relationships which would be very difficult for him to develop.

Dan December 19, 1966

This boy who has been at Linwood for about 2 1/2 years and who had his 12th birthday yesterday, was a very severely withdrawn youngster when he first arrived. He was, as Miss Simons expressed it, "invisible." He had been examined from time to time in various settings and, with one or two exceptions, was thought to be very severely retarded. One or two people thought rather in terms of early infantile autism. In the course of his residence at Linwood, he emerged from his extreme aloneness. He has remained compulsive to the extent of remembering license plates of the cars that come here often enough, the names of every one of the people who accompanied me to the center, telephone numbers and birthdays. He has learned to read fluently and has even acquired some knowledge of French. At the same time his writing is "sloppy," Largely because it does not seem to be meant for other people's perusal.

He is paying a price for his emergence which seems to be so terrifying to him that he responds to conversation with a manic=like kind of behavior as a more than possible defense against coming closer to people. Conversation, in which he answers some questions to the point, (even recognizing and explaining two of the Rinet 10th year absurdities) is accompanied by all sorts of excursions and mergers. He can report some of the happenings at Linwood, chronicling the events with some of the children as a matter of fact occurrence without any kind of emotional participation of sympathy or anger.

As far as learning goes, it is amazing what Linwood has been able to accomplish in the last year or two. The latest test in May by Mrs. Nash shows that he has a verbal I.Q. of 92, though he did much more poorly in the performance item. This certainly does not indicate severe inherent retardation.

This child responds to the criteria of autism: the extreme aloneness for the first 10 years of life, the compulsiveness, the phenominal memory for useless items, and one might add the fear of getting closer to people camouflaged by his manic-like behavior. He is vaguely aware of his difficulties; when asked why he was at Linwood, he started a somewhat diffused discussion of mongolism.

April 22, 1968

Dan, whom I saw in December 1966, has gained a great deal in terms of further acquisition of factual knowledge. He has developed curiosities in certain areas, and has done some reading and inquiries in order to add to his knowledge. At the same time, his behavior in the evaluation session doesn't differ too much form that which he showed at the first meeting. He becomes very much upset by the requirement for closer contact and communication, and still becomes sort of manic-like in his general demeanor. If one didn't know about him and saw him come in for the first time, he would have the feeling that he would not differ from a person in an acute manic state. Except that it is possible to find some doubts to some extent. He said quite a few things during the interview which seemed spontaneous and which referred to matters which had no possible meaning to anyone but himself, though it was evident, at least on a few occasions, that he referred to very specific incidents which you can understand only if you can share his frame of reference or have some ideas of what he is speaking about. Obviously, while he has good sixth grade knowledge and probably better than that, one cannot think in the present time in terms of an attempt to have him attend regular school as some few of the other children did residing at Linwood and going to local public school. This would be too much of a challenge to him and would make his behavior in the classroom in a regular school impossible. Eventually and slowly and gradually,his present experience might lead to such an arrangement, but is still at least a year or two off. Miss Simons plans some occasional visit to a class in which no demands are made of him.

David November 21, 1966

David, who has been at the Linwood Center since October 1964, having been referred by the Walter Reed Hospital, has presented problems from the beginning of life. He was born after a pregnancy in which the mother was hypertensive and labor was protracted. However, his weight was adequate and his motor development presented no particular difficultulties. It was reported that he shunned physical contact, and the father noticed as early as in the child's first year of life that he did not like being picked up. There was some speech development; this has not been specified in any of the reports but mention was made of limited speech. Eventually this became less until it stopped altogether for a time. There is no way of connecting this reduction of speech chronologically with the aseptic meningitis, which he had at age three years and eleven months. Prior to this illness he was described as a loner, not affectionate, a rocker and a head banger. When seen at the Arlington Health Clinic at four years and nine months of age, he tested at a non-verbal I.Q. of 79, and the impression was one of organic difficulty with possible autism.

When he came to the Linwood Center, he screamed compulsively and was, for all practical purposes, mute.

David is the older of two children. He has a sister approximately two years younger. There have been no complaints about her development. The father has been hospitalized for ulcer and arthritis and is also said to have had a mental breakdown. At the time of this child's enrollment at Linwood, he expressed some guilt about beating the child. The mother has been described as "helpless, angry, frustrated, anxious." David has never been in residence here, and there was quite a bit of anxiety on at least two occasions when his continuation at the Center was threatened by financial contingencies.

David was seen by Mrs. Nash about five or six months ago. She felt that this was a bad day for him, he had temper tantrums and it was her impression that he tested at approximately the 4 1/2 year level. It is quite possible that he performed less well there because of the unaccustomed surroundings.

This morning when he was brought for the interview, he automatically shook hands at request; the first handshake had the quality of a dead fish handshake (later handshakes had less of this quality). At request he sat in the chair and remained there throughout the performance, except that from time to time he would get up and wander into the room, returning after request was made. By now he does use language with some occasional echolalia. He brought his school work with him. This is decidedly above the 4 1/2 year level. There was evidence of quite a bit of organization in that he could point correctly to numbers, in and out discrimination. He wrote his first name at request. He also could read the words on his work sheet. As he did so this was accompanied by rhythmic movements of body and arms. He read in a quiet voice and would not raise his voice when asked to do so. The pinprick reaction was somewhat equivocal though he did return to me promptly when I called him back. He did look at me when I pricked him and later on said, "No, no."

Before he left he said very distinctly, "I want to go downstairs."

I do not believe that the meningitis as such has had a decisive part in the etiology of this child's problem, which existed long before the illness. A certain degree of compulsiveness is reported. (He would not leave the bus until a staff member in the group said, "Goodbye.")

I understand that the child's capacity for learning has developed within the past few months. His performance is definitely on the first-grade learning level so that the low I.Q. figure can be discounted as a permanent indication of his endowment. In view of the disability to relate to people, his compulsiveness, his better ability to relate to form boards and the usual educational toys, I would not hesitate to view David as an autistic child.

April 1, 1968

David presented himself today again after I had seen him about a year and a half ago. It is obvious that in his contact with people there is very little if any show of affect in the relationship. At one time he seemed to become angry at Miss Simons when a specific question was asked about his father who is now away. He seemed to have some contact with his father and it is said that he wrote his father unexpectedly a long letter to Viet Nam in which he reported some item of routine of the household but there is no special feeling expressed one way or another. He has made progress in learning; he read a passage from his reader but it was obvious that as he read it was not meant for anybody's hearing or participation of any kind, and during the reading there were quite a few peculiar movements with his hands almost like a ritual connected with reading. The pinprick reaction was more typically autistic today than it was a year and a half ago.

I do not think that there is any question about the diagnostic formulation. This is a typically autistic child in the sense of self-isolation and in the sense of ritualism and more interest in mechanical performance than in any affective meaning. The report from the school about aggressiveness at the present time may be interpreted positively and an attempt to get him to some kind of contact with the other children rather than a matter of particular hostility or animosity toward the other children. On the whole, I should say that this, to me at least, unquestionably autistic child has improved and should remain in the Linwood setting. I anticipate further progress in the mechanics of reading and number concept and writing with a slow attempt, a gradual attempt, to be brought a little closer into the world of people and feelings of people.

Chapter 10
Appendix - Part 1

Dorothy September 19, 1966

Dorothy is at four years of age a physically well developed, well organized, rather agile child, who at the present time seems to feel reasonably comfortable with other people, at least was so during the procedures this afternoon when, in addition to Miss Simons, there were four other people around. It took her only a very short time to warm up to the situation; she responded to and sometimes invited playfulness. She took to the boys and handled them on the whole adroitly. She is definitely right-handed. She scribbled, imitated a vertical line, was not quite able to reproduce a cross or a circle and held the pencil somewhat awkwardly. Her pinprick reaction was decidedly not of the autistic variety. She reacted to the person who pricked at her rather than exclusively to the pin or hand. Eye contact was satisfactory. She enjoyed physical contact. At first, when I asked her to give me one of the toys, there was no response but shortly thereafter she did so and it was even possible to initiate a sort of give-and-take game, although this was not too consistent. She responded with a physionomic sign of pleasure when she was praised for putting two educational toys together. I understand that she swims beautifully.

There was some echolalia but there were also spontaneous phrases, such as "Oh, boy," "Look at." On one occasion she used the word "no" with emphasis but not inappropriately. After leaving, Miss Simons heard her say, "Room fun."

It seems to me that Dorothy must have been a very frightened, panicked child at the time when she came to Linwood. Certainly the story of the mother's horror when she found herself lying near the child and having her hands around Dorothy's throat, would lend substance to a great deal of anxiety in the relationship between mother and child, mostly emanating from the former. It is not evident from the history when the mother had her psychiatric hospitalization. Was this before or after the birth of the twins? If after, who took care of the twins while the mother was away? What was the major problem that brought the mother to Seton? The answers to these questions may throw quite a bit of light on the nature of the child's early emotional problems. The mother has sought psychiatric help and has continued reluctantly becuase of fear of disclosing her therapeutic sessions to her husband. She seems to be crying out for help to herself, and I feel that this cry should be heeded.

I should feel very uncomfortable if I were pushed into the corner and asked to make a specific diagnostic pronouncement. I can say that this is not under any circumstances a typical or even an atypical autistic child. She does not impress me as schizophrenic. Even though she did not--at the last examination--test at a level higher than two and one half years, I am not convinced that she is seriously retarded.

All I can say is that she is a child with major emotional difficulties during the first three and one half years of life, that she has come closer to people and confidence in people and even pleasure with people during her stay at Linwood. A more telling history of inter-family living of the Doyles may give more definite meaning to some of the things which now can only be surmised. At any rate, I feel that prognostically this child presents a better outlook than she did several months ago. I also feel that the mother should--and could--be helped to verbalize her anxieties, which I am sure she has, in relation not only to this child but also to her husband and one of her boys, who is now on juvenile court probation.

April 15, 1968

Dorothy is now approximately five and a half years old. I first saw her on September 19, 1966; at that time I felt that this is not a markedly retarded child and indeed, she does I am sure, follow the four-year requirements and a little better. Her speech has improved considerably, even though there is a considerable amount of echolalia present. Even on one or two occasions she gives evidence of echolalia with nominal reversals. Today she came without difficulty to the examining room, at request shook hands, was acceptable to physical contact which she even on one or two occasions seemed to enjoy. On no occasion did she shrink from it. There is very little physiognomics evident of her feelings, she only smiled once or twice when I put my arm around her. This child is a member of a very disturbed family, but she has made considerable progress at Linwood. She does go home for three days during the weekend. I feel it must be a very difficult situation for her to be in two so discrepant environments. I am convinced that she would have made much more progress and come much closer to people if it weren't for the fact that she had to divide her time between Linwood and her home. But I am afraid because of her mother's intermittent psychotic and always disturbed condition, it would be difficult to change the arrangement. At any rate, I feel that this child should continue at Linwood for quite some time. She has kept for more and more friends, asked for them, in her echolalia fashion but was able to change this to proper views of requests with the proper pronoun when asked to do so. I do not believe that her problem is innate; there is ample cause for the assumption that much of it is coming from a very disturbed and distressing home situation. She is certainly not as panicky as she was when she first came to Linwood, accepts people and their efforts on her behalf much better than she did. If it were possible to make arrangements for a more consistent life, one situation, namely Linwood, I would feel much more optimistic than under the present circumstances.

Chapter 10
Appendix - Part 1.

Ellen October 10, 1966

This is a physically healthy, well-nourished, at least normally intelligent girl who, when she first came here, was self-destructive, and a manipulative, extremely negativistic girl. Lacking the experience of being accepted (and because of her reactions having made acceptance by her parents difficult), she transferred her lack of self-regulation to a persistent effort to regulate her environment. As I saw her today, she still showed signs of negativism and a more or less playful attempt to dominate the situation. However, she was able to yield to counter-manipulation which made use of her resistive tendencies. In this way it was possible to deflect her from some of her shenanigans when those no longer seemed to serve a purpose.

When she arrived in the room, she had her hands before her eyes. She did not say anything in answer to address but very soon, when challenged whether she could do certain things, could not resist the temptation to prove that she could do them. Thus she vacillated between resistance and compliance. This, I understand, is something which she has gained in the course of her stay at Linwood. I certainly would not regard her at present as psychotic or even near-psychotic. If I were pushed into a corner in order to make a diagnostic statement, I would say that Ellen, who needed her remonstrations in order to maintain some strength, is learning slowly but noticeably that no one is threatened or angered by her resistances, which therefore do not serve the purpose which was needed by her in the home situation. I would say then that this is a 5 1/2 year old child who has not quite emerged from a protracted reliance on the oppositional syndrome, but with a gradual reduction of its virulence.

She is becoming more and more accessible to the kind of gentle firmness which, without making her feel guilty, can deflect her intentions to more constructive and more comfortable activities.

I foresee as the best next step continuation at Linwood, as a resident as long as this can be maintained, with the hope that next year, when she is of school age, she can be tried, and if necessary retried, in the nearby public school while she is still residing at Linwood.

April 15, 1968

Ellen who is now almost seven years old has made remarkable progress since she has come to Linwood. There is hardly any of the negativism left that I observed when I first saw her in October 1966. She is cooperative, highly intelligent, on the few sample test questions she easily performed at the seven-year level. She has been attending public school kindergarten in Ellicott City and has made a reasonably good adjustment there. I think this is one of the Exhibit A's of the Linwood Center. I should say that on the whole this child offers an excellent prognosis, especially if allowed to remain in the Linwood situation for quite some time. It is remarkable that this child who has a very difficult family background has been able to reach the status which she now has reached. She is friendly, even invited me on one occasion to come back and see her on May 13th, it turned out that this is her birthday. The best sign of her present condition is that Dr. Hyatt who is along with me made the statement that if he hadn't known of her background, he would have wondered why this child has to be at the Linwood Center at all.

Garth November 28, 1966

I am afraid that the report of my examination of this almost 10 year old boy will have to be quite inconclusive. I saw him once before in February 1964 at the Diagnostic and Evaluation Center, at which time he impressed me as a child lacking directions and quite undecided about his situation to other people. While he was unable to perform in a structured test situation and while during the short interview with me, he could not relate to me or to Dr. Robertson, who was also present, he made no move to leave the room and waited for some kind of approach from us, then deciding whether to respond or not.

When seen by Mrs. Nash, he did a great deal of verbalizing in a manner which she described as reversed speech, but occasionally gave some factual answers to the point.

When seen today he literally had to be dragged in by Miss Simons, sat on the floor at first, then allowed himself to be deposited in the chair, holding his hands tightly before his eyes. At times he allowed Miss Simons to remove his hands from his eyes and to hold them, at other times he would do that for himself. Even when he closed his eyes, he did occasionally peed through. When I lighted a cigar with some flames shooting up, he was quite observant and later on seemed really to enjoy a repeat.

He seems to be in adequate physical condition, he has - unlike most of the children here - developed definite handedness preference (right handed), responded to the pinprick in a manner which indicated that he connected me with it and not a depersonalized hand, showed good coordination with the cylinder blocks, showed good space perception in the jig-saw puzzle (milk man), and when he chose to answer a question, the answers were to the point. He wrote for me his brother's name, his own name, knew the exact date (indicating this by writing November 28), but all the time played the game of doing things on his terms, and you could never tell when he would or would not perform at request. There was little spotaneity throughout except when he was ready to leave. Then he could be engaged in showing his muscles, accepted an empty cigar box from me and upon leaving (tried a little bit to delay the departure), said "Goodbye, Dr. Kanner," and from the hall waved to me. Apparently he could be more spontaneous when he knew that no further relationship would be asked for. I have a feeling that, while with Mrs. Nash, he used his incessant speech as a defense similar to holding his hands before his eyes while here.

I have pitifully little knowledge of the interaction of the family members at home any time during this child's life or the role that his older brother has played.

Diagnostically, I can only tell of the categories that he does not seem to fall into. He is, as his school work here shows, not markedly retarded. He is not autistic. His behavior today would not give any indication of the typical or even atypical constitutionally hebephrenic child.

I suggested that, if possible, I have an opportunity to see both parents and the brother so that we can come closer to an evaluation of how this child fits into the emotional constitution of the family. If there is any kind of organic involvement, there is no demonstrable evidence of it neurologically, electroencephalographically or otherwise pediatrically. I feel that because of his responses at Linwood, operant conditioning might be intensified.

April 15, 1968

When I saw Garth about a year and a half ago, at the Linwood Center, I was again impressed from what I had seen of him a while before when I met him at the Diagnostic Evaluation Center. At that time I was especially impressed by a lack of direction by general inconsistencies of behavior. I made it a point, after seeing him at Linwood, to consult the parents and I learned something which may have a significant importance in this child's development. At the age of nine months he had measles associated with a very high fever, stiffening out in his mother's arms, and at one time a mild convulsion. I cannot explain this child's subsequent development on a basis other than speaking in terms of "a postencephalitic condition." He certainly doesn't fit any of these other categories. It is not a matter of just plain simple retardation nor of autism. The mention of "symbiotic," as made by one examining psychologist, can be explained by the fact that this basically over-protective and anxious mother has so much more cause for clinging to this child and establishing a hope, which I see is prevalent even among the professionals who have dealt with him. The Linwood Center has done much for this child, enabling him, at least, to develop learning at the first-grade level. I personally cannot see in any phase of his behavior a type of cognizance that would make me feel that he has transcended the six-year level. I agree with the Linwood Center that his presence here has reached a point beyond which the Center cannot feel it can go, and I also agree with the plan to think in terms of a hopefully good residential placement center. This would seem to be more logical and most effective.

Gerald October 2, 1967

We are in a way handicapped to quite an extent by the paucity of essential information about this boy's development before the time that he came to Linwood three months ago, at the age of approximately 3 years 10 months. We know roughly that the mother had vaginal bleeding during the last trimester of pregnancy, that some measures were taken "to prevent prematurity," that he weighed about 6 lbs. at birth though thought one month premature, that he had a febrile convulsion at 13 months and that in the short time of his life he has started out in Washington, then to Hawaii and Korea and came back to Washington. We know little about the circumstances and living conditions and the family emotional constellation during all this time. While he was seen at Walter Reed Hospital he was upon his arrival at Linwood, unresponsive, had no form of vocal communication and was not toilet trained. He had and still has a habit of bumping his head, to the point of requiring stitches now and then.

As seen today he still has only a limited and fleeting contact with people and at the same time relates to objects in a rather specific way. He is a skillful spinner of objects that can be spun, can--but does not always--place the cylinders in the proper holes of the Montessori arrangements, has a limited concept of how to handle a ball. There are some grunt-like sounds both when he is pleased and especially when he is displeased. Though at one time he did (for the first time, they told me) indulge in some gibberish in which vowels and consonants could be distinguished. At times he was able to smile though it would be difficult to correlate this with any particular situation. His response to pin prick was one which he related much more definitely to the pin than to the person who pricked him. There were several forms of bizarre behavior which seemed ritualistic such as tapping objects (cylinders, crays) against his mouth, beating the backs of his hands against each other, and when he left performing something like a dance. At his age, he has acquired the ability to whistle better than most children his age can, and at one time whistled to a tune which was sung to him.

On the whole his contact with people is extremely limited and there was hardly any interest in any of the people around him or in anything that happened in the room.

I would not hesitate to say that the child presents the basic features of the autistic syndrome. There is the aloneness and there are some ritual features, the spinning with fine coordination better than gross coordination. Nevertheless, I feel that we cannot disregard the history of the bleeding and whatever gynecological or pre-obstetric manipulation there was and the story of one convulsion.

I would also say that in the three months he has been at Linwood he has shown some signs though minimal as yet, of progress--there is some smiling, there was a first instance of gibberish, there is a whistling to a tune. I thought that on a few occasions it was possible to deflect him a bit from the spinning to which, however, he returned again and again.

June 17, 1968

Casual observation might initially lead one to believe that this child presents almost exactly the same pattern that he did last October when he was seen. On the other hand, closer observation brings out two points: one is that while there is still no verbal communication of any kind, his vocalization shows quite a bit of greater modulation than there was before. He is still interested in the ritualism of spinning which when he is confronted with any spinning, it gives him a great dela of excitement, almost ecstasy, and jumps up and down, at the same time getting his arms together and very often combining this with the other ritualism still of tapping against his cheek or against his mouth. There is one thing that came out in this observation, and this is that while he was interested in this spinning top he learned to manipulate it; he was confronted with it at a time when he did not know how to handle it, and gradually he could develop this technique quite skillfully. Once he did, it was very difficult to divert him from it and I am sure that this could have gone on for a long, long time with repeated ecstasy and repeated performance of jumping up and down and tapping his mouth and cheeks. I feel that this child is now getting ready for the sort of operant conditioning techniques that might help him to get away from his extreme preoccupation and help him learn to develop some patterns that go beyond the limited present pattern that he shows.

Grant November 28, 1966

Grant is a thin, physically healthy 5 1/2 year old boy who has been at Linw-od for approximately 4 1/2 months. Pregnancy and birth were normal. He did not walk alone until about 16 to 17 months of age but then immediately began to run. He seemed to have hearing difficulties which began to improve after a tonsillectomy at 2 1/2 years. Since that time his hearing improved; however, the hospitalization was a highly traumatic affair. The mother was not allowed to see him and he was force fed. Eating became even more of a problem than it had been before and he was readmitted to the hospital because of dehydration. He was seen at the Children's Hospital in Washington where Dr. Lourie saw a combination of psychosis, retardation and possible minimal brain injury.

The parents report that since his hospitalization, this child has been running away from home without any particular aim. While at Linwood, he ran away several times and on three occasions the Police had to be notified and he was picked up by the Police. He would have run away oftener if it were not for the close supervision. He has sometimes used almost ingenious devices to get away from the building.

When seen today, this child spent much of his time trying to get away from anybody who tried to hold him, tried every exit, and several times said, "Goodbye." In between, with some not too gentle persuasion, he was able to do some very simple hig-saw puzzles, sang or hummed happily while doing this, thumbed through the pages of a telephone book, and occasionally uttered a few words. He definitely saw me as the perpetrator when I pricked him with the pin, and said, "Don't you hurt me." I am told that he recognizes the names of the states. In this particular situation he made no effort to do so but apparently he has the ability.

Diagnostically, one is very much impressed by this child's persistent and active desire to get away from people and from structured situations. He seems to be bent on this more than on anything else.

This child has had difficulty in relating from an early age but it is quite possible that the traumata of hospitalization may have accentuated the desire for withdrawal which, one may say, he keeps practicing constantly as a perpetual urge. For the purpose of categorizing, I would feel that this child fits best into the general diagnosis of schizophrenia, without any particular sub-division or sub-specification.

April 8, 1968

In quite a few respects Grant has shown progress largely in the area of vocabulary, reading, writing, and spelling. In which areas he performed as much work as any six-year old would. He ahs also shown progress in the sense that he now tolerates the presence of people and that is not as he did in my first acquaintance with the child in November 1966, run away from people in such situations. This progress is one of challenge, a certain attitude, a certain desire to want to get this child forward much more in other areas than those that I have mentioned. Diagnostically, I think this child fits in best with the conditions described in this country most aptly by Louis Desperete as the schizophrenia with insidious onsets. I don't believe that he fits particularly any of the more specified forms such as symbiosis or autism. So I think we can reiterate that this child's behavior resembles most closely that of a schizophrenic child without any particular specifications. The fact that he has learned more than mechanically the art of reading and writing at his age level would make one feel that remaining at the Linwood Center may, at this rate of progress, with emphasis on closer contact with people over and above these gains.

Hal October 31, 1966

At approximately 10 1/2 years of age, this physically small and immature boy does not in any area of living transcend socially, communicatively, and in play or handling of objects, the level of at best a three year old. If the history given by the family is correct, he got along well until the age of about 19 months. He developed speech at about one year of age and was toilet trained at an early time. Then there was said to have been a regression and a "reversion" to simpler language. At 18 to 19 months of age he is said to have had a low-grade infection, after which there was a deterioration all around except that he has remained toilet trained. At the present time he has no intelligible speech except for a few words having to do with the naming of a limited number of objects. He seems to be generally at peace with the world, laughs heartily at times with little noticeable connection with the situation other than a general feeling of satisfaction. There are occasional noises, all of which accompanied with pleasure rather than anxiety or any kind of distress. He is not by any means autistically withdrawn or resistive. He does not seem to be threatened by requests or demands; at least in the interview situation is generally what resembles more Elsie, Borden's Contented Cow, than a child in dread, anger, or pleasure from being with people. In the 10 1/2 years of his life, he has learned to handle simple (very simple) form boards and is able to replace the cylinder blocks in their proper holes without trial and error. He is able, with some prompting, to dress and undress himself, to feed himself properly and, when he is in the mood, is capable of some degree of automatic obedience.

If one assumes that the early history, as given by the family can be relied upon, one cannot help but think in terms of something akin to Heller's desiease, where there is smooth development for the first 1 1/2 to 2 1/2 years and then a complete regression, which may reach a low plateau, so low that there is little prospect of trainability for social functioning. A brain biopsy has shown in many instances a ganglion cell dilapidation in the lower strata of the cortex. Whether or not this would be found here, we cannot get away from the fact that, as this child is now, he is markedly defective in his overall development. I have not even been able to elicit any of the usual play responses of an average 2 to 3 year old child, such as "Peek-a-boo." He can come to fetch a piece of candy but, it seemed to me, only if he can see the candy itself. He also can go into pocketbooks when he knows there is some candy. He did on one occasion utter the word, "pocketbook."

None of this adds up to any justification for thinking of psychotic development by whatever name. This is basically a very severely retarded child. If one were to put down an I.Q. figure it would be certainly below 35. Unless miracles happen, this child will need life-long care and supervision. A period of residence at the Linwood Center may help the parents to prepare themselves and be prepared for permanent residential placement of this child.

April 1, 1968

Hal will be twelve years old in about a month. In all of his performances he remains at a level certainly not above two to two and a half years of age. Since I saw him about a year and a half ago he is the same generally happy, contented child who has neither anger nor resentment with anybody or anything. There is now even less question than there was initially that we deal with a child whose problem is along the lines of what is called Heller's Disease or dementia infantilis. I think the great benefit of his residence at the Linwood School was (a) that a child with all his difficulties was in a situation where he could be made to feel comfortable and (b) in the sense that the parents had had an opportunity to adjust themselves to the acceptance of the knowledge that this is a markedly defective child in all areas.

Jackie December 5, 1966

There are few children at Linwood who have not at one time or another been "diagnosed" as autistic. This child was correctly recognized as autistic first by a psychiatrist in California and then by Dr. George Frankl at Winston-Salem. This history as well as the present performance are very much in keeping with the criteria which I describe in my first publication (1943) under the title of "Autistic Disturbances of Affective Contact." There is the aloneness and the compulsive desire for preservation of the sameness. He is able, and has been able for quite some time, to read fluently. While at first it was more mechanical with little comprehension of semantics, he is now much more aware of the contents. On one of his papers, where he is to find opposites to a number of words, he wrote "parents" as an opposite of "peace." His parents are now divorced and he and his brother are with their mother.

The father is described as detached from people, somewhat on the passive side.

Jimmy disliked the interview situation, declaring that he would not do certain things asked of him by saying "No," and, when he left, declaring just as openly that he did not enjoy the experience. However, he immediately sat down to do an intricate jigsaw puzzle being guided by the shape of the pieces rather than the content of the picture.

This child has made progress at Linwood even though his relationship to people is still tenuous. One looks forward to the time when it may be possible to arrange for public school attendance while he is at Linwood. He will relate himself well to books and to matters of memory, the teachers serving mainly as opportunities for leading him to this kind of activity.

April 8, 1968

Jackie is now eleven years old, and has in the time that he was here made considerable progress. Even though, at his age, his general scholastic achievement is at the third grade level, I think one can say that this child has offers of promise of further growth and development in terms of scholastic learning. The one thing that impresses me a great deal is that since the time that I saw him, he has come closer to being reasonably comfortable with people much more so than he was at the time when there was no question about his wanting to stay away and declaring definitely that he wouldn't do things, and that he wouldn't progress. At this time he answers questions quite readily, again a little bit uneasy when the conversation was led to members of the family. This extremely serious-minded child whom I saw about a year and a quarter ago, now is amenable to some degree of amusement and response to humor much more than he did. I have no cause to change the diagnostic formulation. How soon and to what degree he will emerge to become a full fledged member of a group, I cannot predict, but I certainly think that he can make progress in terms of learning and also in terms of approaching a greater sense of reality and contact with people.

Jerry November 14, 1966

Before discussing my experiences with Jerry, I think it would be helpful if Miss Simons on the basis of her observation of the parents could enter a few introductory notes which seem very important here in the evaluation of this boy's development.

Miss Simons: "The mother is an extremely rigid woman; she looks it. She always seems close to tears and has a high-pitched voice. The father on the surface seems easy-going but cannot let anything

> interfere with his own rather narrow world, which is his job and his car. He has no friends as he feels people are dangerous and they can do you harm. The older girl, who is 9 years older than Jimmy, is a miniature of the mother just looking at her; the same high-pitched voice, the same rigid face, although she has been able to express anger toward the father. Her reason for going to college away from home was that she would be away from home and not have to face the father.
>
> The father in order to live comfortably has asked complete obedience from the children. He does not quite know why except that children should be obedient, and when he asks something, this has to be done immediately. He gives an order and it has to be done immediately. He has been known to spank or hit the children - the older girl even when she was still in her teens. He has used a belt. While he explains all this, his face has a vague, friendly smile, and he doesn't seem to feel bad or guilty about it. This is the way he wants it. With Jerry he has used the same kind of methods. After the first years, he noticed that hitting Jerry did not bring obedience, and after being in counseling here for about a year, he said that he had given up hitting the child. He also had resigned himself that Jerry would never be any better than he was.
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> The mother has been able to express some dissatisfaction or anger toward her husband in group sessions, supported by the other group members. When she did this, her voice was never more natural and her face more relaxed. Before she expressed herself freely, she asked her husband if he would be angry at her afterwards."

I feel it is essential to know about this background as one tries to evaluate the child's present condition and the development which has taken place in the past three years since Jerry has come to the Linwood Center. According to the history, he was born normally at term after a normal pregnancy. There was some slight delay in motor development; he did not walk until 17 months of age. Toilet training was not accomplished at the time when he came to Linwood. At the present time he has adequate sphincter control. The parents report that this child was quite ritualistic and when out for walks had to be taken in the same direction. While there was little, if any, language, he is reported to have said to the parents: "Do you want to eat the baby?" I am not sure that this is what he really said but this is what the parents heard.

When he was brought in by Miss Simons, I called him and at request he shook hands, offering the left hand. (A little later, when playing with the toys, he used the right hand predominantly.) On my invitation he sat down on my lap. In the particular chair in which I was, he was at first a bit uncomfortable when I tried to put him in an embraceive type of position. It did not take long to have him adjust, and after that he not only was quite comfortable but really seemed to enjoy the contact. All during the interview he accepted from me, from Dr. Mausberg, and, of course, from Miss Simons, some cuddling in a passive way, but willingly and never showing any signs of fear or shrinking. He could be engaged in play at a primitive level, such as running after him, during which he was rather skillful. This he enjoyed considerably. He performed the cylinder block test and the pyramid--consisting of rings of different sizes--and again he skillfully put them in accordance with size, immediately noticing one mistake that he made and correcting it. After some hesitation, he handed some objects to other people. On one occasion when I put a book of matches on the table and asked him to hand me a match, he literally took a match out of the book and handed one match to me. There was no verbalization or vocalization or any noises during the whole performance except tht sometimes, when chased, there was audible laughter. At this time I could find no evidence of any kind of compulsiveness.

As I see him now he does not present at least one of the principle criteria of autism--there is no ritualism, no repetitiousness, no insistence of the preservation of sameness. Also he accepted closeness to people much more readily than an autistic child would. There is quite a bit of passivity in his behavior, a facile acceptance of approach that he enjoys but, during the period of the interview, no reciprocity. Any contribution on his part had to be manually guided. This he also conformed to previously.

From time to time he looked away in a manner which would impress an observer of an adult as possible hallucination. As he is now, I cannot possibly view this child as either inherently mentally defective or as atypically autistic. If I were pushed into a corner to make a diagnostic pronouncement, I would consider this child rather as globally schizophrenic, without any kind of specification.

I feel that if this child had an opportunity to have someone start in a one-person-to-one-person relationship over long periods of time, without the interference of these parents, he could be helped to a better relationship and even to verbal interchange. I do not know how this can be accomplished since I would not feel that the parents have sufficient understanding to see the necessity of this. It may sound superficial but I might almost say that this child must have been terrified into schizophrenic withdrawal. He was certainly brought up in an emotionally morbid environment, and he has now reached the stage, with the help of his Linwood experience, when he can start out on an infantile level of far greater comfort than he must have experienced. He responds to warmth and seems to be beginning to learn to give back in kind. He has had many physical investigations, including electroencephalogram, which do not yield any guidelines in this direction.

April 15, 1968

Having seen Jerry about a year and a half ago, there has been, with minor exceptions, a stationary picture. This concerns me in my own impression of a schizophrenic withdrawal; the child having remained in that state since a very early age. There is still no speech, though he does understand other people's speech at an early level of development. I can see no answer to this child's future needs other than eventual placement in a residential hospital. It is, fortunately, possible to retain him at Linwood during the period when the mother is being helped to accept life without Jerry. If and when this is accomplished, I think the hospital placement for the duration of his existence must be anticipated.

Karen October 3, 1966

As we see Karen now, she presents a somewhat ambiguous picture of a child who can be induced to be playful in a motor way, once the initiative has come from somebody else. I have an idea that on occasions she may even be spontaneous in her own initiation to this form of play. When she entered the room where several people were present, she walked right straight between them without looking at any one person. In this interesting situation, I could not detect any eye contact except for some fleeting look in the direction of, rather than at the person. She is obviously more at home with objects than with people and has adequate motor coordination in putting things into holes and handles educational toys with reasonable skill, except when it comes to screwing and unscrewing. This is the only occasion when she invokes somebody's help, leading her helper's hand toward the object. She has a good sense of colors and is able to arrange things in accordance with colors. In one box with separate compartments, she put the object of each color in its appropriate compartment. She can distinguish green from turquoise. In handling objects, she still has not developed a full handedness preference. In most instances she uses her left hand.

While she was occupied with the educational toys she adhered to strict notions of what she wanted to do and becmae upset when there was any interference and what she felt was the appropriate producure. She was most upset by the interference rather than at the interferer.

When I picked her up she struggled and was not to be assured by pulling. She was more tolerant when a staff member picked her up at the time of her leaving--but even then it was more tolerance than pleasure at the experience.

I am impressed by the fact that, when tested by Mrs. Nash, she did items up to 2 and 2 1/2 years adequately but not beyond this age level. Her whole demeanor in effect, impressed me as that of a disturbed 2 1/2 year old rather than one of a child close to 5 years of age.

Nevertheless, the child does show preference to objects as against people; is intensely interested in what happens to the objects that she handles, at times making use of people's hands to give her help with the objects she cannot conceive by herself. She does show displeasure, which is somewhat vigorous, when people interfere with her designs. When the cylinder blocks were taken out for her not exactly in the right order she became quite upset, but went on quietly when the order was restored.

The pinprick reaction was quite ambiguous. She did connect the pinprick with me and not completely with my hand.

Whatever the basic nature of the performance might be, the child now functions at a markedly retarded level as shown by Mrs. Nash's experience with her, and also by her general demeanor; yet autism features are undeniable. It is difficult to say whether the unquestionable progress which has been made at Linwood is one of better than emotional adjustment or whether it is something which one might find in a markedly retarded child who has had the benefit of the personal attention which she has received at Linwood.

One wishes it were possible to obtain a more detailed and meaningful background to account for the first few years of the child's life. By the time this child arrived, unclad,there were three small children around--the oldest yet at the beginning of school age, and one wonders how much and what kind of attention the mother was able to give her at the time. It would also be interesting to know how these other children had progressed.

Nonetheless, I cannot get away from the conviction that this child shows an inherent, innate problem. The mother was unhappy from the beginning because of her feeling that neither she nor her husband could reach the child. While the prognosis is guarded, the child is undoubtedly benefiting from her experience at Linwood, and she had best continue. She has developed a fairly adequate sphincter control; she has become physically nimble; she feeds herself with some compulsive behavior connected with her feeding--and she is responding to the invitation to rough play with some evidence of pleasure.

April 1, 1968

Karen is now almost 6 1/2 years old. As she appeared today it seems that it will be necessary for me to revise the impressions which I had of the child about a year and a half ago. The outstanding feature now is that the child is beginning to imitate sounds, seems to derive pleasure from her apparently recently gained ability, works hard at it, and repeats words heard, at the same time in a very labored way and with some obvious suffering. I do believe that before we can come to any clear understanding of this child's problems it will be imperative to have a good speech and hearing evaluation and also a good neurological examination. The kind of speech that this child produces has, even though there are no signs of visible neurological impairment, very much the quality of a cerebral palsy type of athetoid speech. I would suggest that this examination be made as soon as humanly possible and I don't believe we can come to any clear understanding of what ails this child before we have the results of such detailed examinations.

Ken December 17, 1966

This 9 1/2 year old boy has been at the Linwood Center since June 1962. He presented problems from a very early age to a point that the parents became concerned and consulted someone when Ken was in his third year of life. He was satisfied being in his playpen, was afraid to leave the house, afraid of drinking glasses and of strangers. There were a very small number of words which he said but which, according to the history, seemed to have no communicative connotations. In his fourth year of life, his mother committed suicide by hanging in the basement. After this he had a great fear of basements and, when he first came to the Linwood Center, was panicky about going into the basement. He had certain peculiarities such as entering a room on one side of the door only. There is a history of long food capriciousness, and he went through a period of holding back his feces. Improvement began to set in approximately a year ago, when he developed good sphincter control and when it was possible to have him change his status from a resident to a day patient. This was due to the fact that his father remarried and the step mother, a warm person, has known how to handle him as well as the six other children from the father's previous marriage and her own child.

Ken, when seen today, appeared to be in good physical condition. He is sturdily built and has a somewhat large cranium and rather high forehead. He has gained speech to the extent that there is considerable echolalia and his voice is high pitched. For want of a better term, I would say that it resembles somewhat the "Donald Duck" speech. Much is not intelligible. His echolalia expressions are pronounced more clearly than naming of things. Obviously most of his speech is not intended for communication. The echolalia assumes the inflections of the way the sentence has been presented to him. In between these he interjects frequently something that sounds like "da-da-da-de-da," again in a high-pitched tone. All the while he seems reasonably comfortable in the situation. There is no evidence of the self-destruction which existed at the time when he came here, which consisted often of choking himself and others.

He does simple jig-saw puzzles adequately, built a tower of at least 12 blocks before it collapsed. He put the blocks down, making sure that the upper side matched the rest. He allowed changes to be made in the order but then finally he arranged all of them in the same manner, handing two blocks back to me when I handed them to him with the wrong side up.

The pin prick reaction is definitely in relation to the pin rather than to me. When I stepped on a block and he wanted to retrieve it, he struggled with my foot and did not seem to connect me with the process.

The history and his behavior today make me feel that this is a typical autistic child who is just beginning to show signs of emergence. He has learned to sing "Jingle Bells" with a reasonably good reproduction of the tune, he has learned to draw a Christmas tree, even made a primitive attempt to draw a person, named some of the elementary colors, and responded to Miss Simons's correction of some of the not too well pronounced words. The child is now ready for more intensive instruction and I strongly recommend that he remain at the Linwood Center. There has been definite progress since his arrival at the Center and more progress can be conceived.

April 29, 1968

I saw Ken in December 1966. Since then, I can see a great deal of progress in many respects, even though basically, he remains as autistic as he was. There is a great deal of echolalia. Hardly have I ever seen an echolalic child who could use his echolalia as, in a way, effeciently as this child does. It serves the purpose of keeping away from any involvement. This is also true of singing and is also true of doing the kind of form-board work with reminiscence of the cos blocks. In fact, I do think that it might be a good thing to have him practice on the cos blocks for I think he will come up very high compared to many of his other functions. He has acquired some need for contact with some people and it was remarkable how he managed to point again and again spontaneously to one of the teachers seeming to rejoice in being able to refer to her as "Marsha." When he sat down next to me, he didn't shrink from any physical contact except when he was singing a song. While he did that I could hold his hand and it was a good contact as soon as the song was over he immediately withdrew his hand. So that he almost noticeably uses his activities such as singing, working on the blocks, or his echolalia as a means of keeping away from the need for establishing any contact. At the same time, he did occasionally answer a question but only in one or two words. He was able to give his address. At one time he spoke of Washington, D.C. and it was not possible to have him use the word Washington without him adding the word D.C. so that there is quite a bit of evidnece of echolalia as a means of staying away from more intimate contact. There is evidence of the ability to use the echolalia or a similar activity as a means of keeping a distance from people but while he has the security of these activities, he tolerated my hand on his and seemed to feel comfortable. I understand that he will receive speech therapy shortly, and I think that would be a good idea. Not so much because of his ability or inability to speak,I think he has a good basic ability. From the point of view of having additional contact with somebody even if it is in the manner of mechanical repetition of words, which as time goes on, becomes less mechanical and makes possible contact with one and possibly more of his teachers.

Kent October 3, 1966

This child's arrival was preceded by our obtaining a report from Georgetown University. This was very helpful insofar as we thereby had unusually good and detailed background information. I was further helped by a note from Dr. Schultz, who had seen the child with Miss Simons and was able to make some pertinent observations.

I saw the parents again. Even though they sat facing me, next to each other, their closeness was merely geographic. The father was a bit more spontaneous and direct in answering questions. The mother seemed to weigh each question first before deciding on an answer. Several of her answers were either contradictory or were modified a bit to suit the purpose. She tried to intellectualize but went about it not too intelligently. This came out several times. They both described themselves as not too sociable. They are "friendly" with neighbors but there is very little real contact with them. They have, as father says, "acquaintances" but no friends. The mother reported that she felt from the first week of the child's life that there was something unusual about him. His way of crying and persistent frequency of crying.

I gave them an opportunity to be spontaneous by asking them towards the end whether there was anything that they wanted to tell me not contained in the questions. Nothing significant was forthcoming. I had to make it easy by asking another question. Between them there was quite a bit of fast talking until one or the other changed or modified something the partner had said. They both said that they could be affectionate with the child but there was not much compensation, though the father gave the impression of somewhat greater warmth, mostly in terms of providing material needs and some physical contact with him.

Both parents felt they would like to have their child at Linwood and faintly expressed a wish of wanting to know what was done here.

Chapter 10
Appendix - Part 1

The child allowed himself to become engaged in play while waiting for the interview here. When he came in, he showed no interest in contact with people and yet seemed a bit more aware of persons and what they did than some of the children I have seen here; while, as the mother said correctly, Kent "lives in a world of his own," he does so leaving the world outside not entirely outside the range of his awareness. There is some eye contact, more as a matter of curiosity than as a matter of relationship. When given one of the educational toys, he handled it fairly adequately but became easily frustrated when he could not maneuver parts of it as he wanted. However, when our back was turned, he redid the whole thing. He was adept with cylinder blocks and I am not sure that he even got the concept. He allowed me to pick him up and started climbing up on me, and a while later, also on Miss Simons. Physical contact did not seem obnoxious to him. He reacted to the pinprick in a manner which included me as a person rather than dealing with a depersonalized hand.

(I omitted to mention before that the parents report--not spontaneously but in answer to my question--that he also spanks himself on the bottom or hand or sides. The mother added that it was imitation of what was done to him, so they made sure to state that he is never punished severely.)

This child though autistically remote, shows signs of readiness to accept approaches from others, wanders on occasions but allows you to resume negotiations. I anticipate noticeable growth at Linwood.

June 19, 1968

If one were to see Kent for the first time without the knowledge of his background, one could be easily misled into believing that this basically is a very retarded child who at the age of six and a half years is still not speaking; who enjoys very infantile play. I saw this child about a year and three-quarters ago and on the basis of my observations then and his present condition, I would be inclined to feel that there has been a great deal of progress made in the child where change of situation has resulted in a remarkable change in the child himself. He is emerging from a state of passivity to one of making approaches to people. He has now the courage to tease, to find himself in a relationship with persons which is entirely different from what I had seen at first encounter. Not knowing him, one would say that this is a child with no verbal communication; on the other hand, there is a great deal, now, of babbling, of repeating sounds, of putting some words into the sounds that are connected with a tune. I understand that he also has begun to use some real words which he pronounces intelligibly. I think that a great deal of benefit has been derived by his being here as a patient in residence rather than commuting between the home and the Linwood Center, so that he doesn't have the constant daily change of two entirely different relationship patterns. This is a child who now at the age of six, experiences the kind of things that the average child has from the beginning, and is responding to this in the way a child would at the beginning. On the whole, I would say that this child's newly-gained naughtiness is a sign of very very great progress, and I hope that he will have an opportunity to remain here for a good long while. I can foresee, not miracles, but considerable advances.

Les October 2, 1967

Referring to my first note in February of this year, I should like to say that this child seems to have much better contact with people--there is eye contact, at one time he came to sit, at least for a short moment, close to one of the group and he really made a great performance of climbing up on me and doing something with my hair. He also seemed displeased when he was removed from the scene of action. There is less of typically autistic aloneness now, and I wonder with the history of being in a case for the first year of life, whether this did not contribute to the isolation from other people.

June 17, 1968

Les, whom I first saw just about a year ago and who was accepted at Linwood last fall, is still a child who on nothing but a psychometric test would come at a very low age of certainly less than two years. He has gained, according to the Linwood personnel and also especially according to the parents themselves, in interpersonal contact with people around him, though that gain again, still does not transcent a very early age. Some immediate questions have arisen with regard to the next steps. The father has obtained a very satisfactory position in his home country and is just about ready to sign a contract which will re-establish him in the Dominican Republic and they plan to live there very shortly. The father has looked around for possibilities and he has suggested a number of alternatives. The way Les is functioning now, I think his first suggestion is probably the most acceptable. They have now formed a small group for severely retarded children with supposedly some well-trained people from Cuba and Uruguay who come there to conduct the school which is under the supervision of a physician who is very much interested in the promotion of the project. Meanwhile, it seems that it would be a very good thing--and I have discussed that with the father--to have someone of the group come to Linwood for a time of observation and training so that something akin to Linwood (I don't believe there is anything equal to Linwood) can be arranged there, and then Les might join that group. Diagnostically, it would be very very difficult to say anything definite. Although there are autistic tendencies, this child's early background of a year in a case, in isolation, under frequent anesthesia, a child who had some physical anomalies at the time of birth, would make one feel that there is a plurality of factors that could be considered in this child's development, even though one is not even certain whether there was not originally a marked degree of inherent retardation.

Mark September 26, 1966

I saw Michael about a year ago when the parents applied for his admission to the Children's Guild. Mark, at that time, had no difficulty separating from his parents. He immediately occupied himself with some toys, which he handled without any particularly evident purpose, certainly not the purpose meant for them. There was no verbal response to any remarks or questions of mine. There was no eye contact. He seemed neither to accept or reject me. I was also there and so long as I did not interfere, he did not mind but he shrank from physical contact of any kind. He was as ready to leave the office as he had been to come. He showed the typical pinprick reaction. In my interview with the parents (and it was really my interview rather than their with me) both waited for any spontaneity or initiative to come from me. The mother did most of the speaking, always in response to my questions. The father, who has a not too severe but noticeable speech difficulty, entered only sporadically and briefly into the conversation. When he did so it was when I addressed him personally. I was impressed by the mother's vagueness in her responses and also by her inability to focus on me, her husband or anything else in the room steadily. I felt that this child needed more than the Guild could offer at the time, and I suggested the Linwood Center. The parents accepted that but it surprised me that at the time neither of them asked for any specific data about the Linwood Center.

When I saw Mark today, I could not help but feel that he has gained a great deal since I first saw him. There is still the typical pin-prick reaction, there is still his failure to communicate other than with my foot--with my holding it over an object in which he was interested. But, on the other hand, there was some occasional fleeting eye contact. He tolerated, to put it more strongly, seemed to accept my holding him on my lap for a few seconds and certainly seemed pleased when Miss Simons took him on her lap. I understand that after some difficulty fecal control was established, and he has some continuous contact with other children. His fine motor coordination is adequate. His speech, even though not directly communicative, is mostly limited to his preoccupation with letters and numbers. He was able to name the pictures and look for initial letters corresponding to the names of the items of the pictures. He seems to be able to accept gaps. In the letters of the first series, "7" was missing. I know some autistic children who would go into a panic and not be satisfied until the letter was presented but he just left a gap between the 6 and the 8 and went on and did not show any particular enthusiasm when the 7 was found.

When invited to shake hands with the people present, he conformed in a sort of mechanical manner. He went up to the person and waited until a hand was held out to him, and then used either his right or his left hand. In all of his activities it was noted that definite handedness had not as yet been established.

He was not uncomfortable in the presence of people but he walked between them without any particular attention to anyone. We consisted not as a threat, and I guess because of our own behavior, not as an unwelcome interference. On one occasion, however, he came up to me and said repeatedly, with quite a bit of pleasure, "Thank you. Thank you very much."

Diagnostically, I should not hesitate to speak of this child as an autistic child with some emergence from aloneness and with a reduction of the compulsion and the "preservation of sameness" desire. So far it has been easier to reach the child than it has been to reach the mother, and the father is still a puzzle to me as far as his role with the child is concerned. I am sorry that I did not understand what he said when I asked him about his sisters and where his daddy and his mommy were. He did say something, which did not sound to me--ot to anyone else in the room--as an answer to my question. This is a child who will need protracted help from Linwood Center. With it, I think that the prognosis is better than that of a year ago; without it, the eventual outlook is problematical.

April 29, 1968

Mark whom I saw in September 1966 is now 6 years old. Mark has made tremendous progress in the intervening time. He is one of those autistic children who can associate themselves with reasonable comfort and some eagerness to mechanical reading and number work. He has acquired a sufficient capacity for reading which might be considered as high first- or low second-grade reading, but while he does very well mechanically, he is not quite able to integrate this sufficiently to talk about what happens to the people and answer questions about it in a way which makes one sure that he does not consistently, or even inconsistently, correlate the concept of his reading with the happening reported there. First, as he came in, he did well in answering questions and performing on the blackboard but very soon it became obvious that this conformity was too much for him and he became quite noisy and slightly rambunctious. There are some inconsistencies for one thing, he did remember the pin prick given him almost two years ago; he came reluctantly, he got his pin prick, and then said, "I hurt myself," rather than referring to me, and later on he would not come near the pin. However, from a distance he good-naturedly waved good-bye to me. On leaving he was quite ambivalent and first said he wished to stay and immediately thereafter said he wished to leave, and he did. I am quite optimistic with regard to this child's collective progress. Concerning his contact with people, this child has to gain quite a bit more and will do so in the course of time. It is fortunate that he has been here since the age of not quite five years and that there is an opportunity for him to remain here for several years. Both the early contact with Linwood and the fact that he will have this much time more are good prognostic signs.

Phil October 17, 1966

This is a child who came to the Linwood Center four years ago when he was inaccessible, severely disturbed, hyperkinetic, destructive, unrelated to people and only moderately related to objects, wetting and soiling indiscriminately. This condition has continued for quite some time, regardless of whether he was at Linwood as a day student or as a resident. He came accompanied by notes of a neurological examination and of two years' weekly therapeutic hours at a Child Guidance Clinic. From those sources, we have a history which describes the child's behavior, reports inconclusive or altogether negative E.E.G. and pneumoencephalogram findings and gives a framework of the background that is not too helpful in terms of early attitudes surrounding the child. We know that a second child was born to the parents when Phil was about a year old, and that the family moved when he was two years old.

At Linwood the described behavior went on for better than three years, but a few months ago a noticeable change occurred.

When Phil was seen today, he immediately showed an awareness of the people in the room, accepted introductions, repeated the names (How do you do, Dr. ..."), identified Miss Simons and Mrs. Mitchell and Dr. Ferster, whose name he did not quite remember with certainty until Miss Simons provided the first letter. He sat down at invitation, agreed to play with the toys. He has learned to count and to identify letters of the alphabet. He handled the cylinder blocks adroitly though ambidextrously, and generally showed good coordination. When asked to draw a boy, he first printed the word BOY and then produced a Humpty-Dumpty-like creature, into which he spontaneously put the mouth and, at special request, also eyes and ear. There was quite a bit of repetition of questions asked of him, but not quite in the form of real echolalia. It seemed that he actually enjoyed the sound, and there was quite a bit of inflection in his repetitions. I could not help but feel that there was some pleasure that he derived from the novelty of the situation and of his own participation in it, almost as if he was making discoveries. He was able to repeat five digits forward, could not do it with six digits, but did not get the concept of repeating three digits backward. When asked what a chair is, his reply was "green" (the color of the chair in which he was sitting). By the same token, a pencil was "yellow." When asked what a horse was, he said "h-o-r-s-e." It seems that this child is groping for communications, and gives the one that occurs to him immediately. At request, after some hesitation, he even drew a horse, which had four legs and a head and a tail. He was friendly throughout and was definitely with the people who spoke to him.

When I tried the pinprick reaction, he definitely connected the act with me, looked up to me frightened and pleading and later on, at Miss Simons's suggestion, asked me on the toy telephone not to do it again. However, this act was not fully completed by then. When he left he properly addressed the three other people as "Doctor," whereas he emphatically called mr "Mister Kanner."

This child offers diagnostic quandaries. We can't say that there is nothing in his history or demeanor that would indicate ascertainable CNS or metabolic disturbance. While the early history of supposedly normal progress for two years followed by regression, can make one think for a moment of Heller's Disease, he has certainly emerged to a point that this can be excluded. He may have appeared as a severely retarded child, but the last few months indicate an increased ability and desire to learn. His hand printing is neat. He promptly spells out certain simple words. The pinprick reaction and his capacity for being with people keeps one from accepting the diagnosis of autism unless there has been unexpected emergence to such an extent. One may, because of the history and some of his described performances, think of a "schizophrenic" development in the broadest sense of this word.

Suffice it to say that, considering the history and the early observations at Linwood, this child has made phenomenal progress, in a situation in which he was given opportunity to discover his identity in contact with other people, less threatening to him than other contacts must have been before. At the present time, he is a friendly child, has developed adequate sphincter control, is learning to read and to write and--to quote Miss Simons--has discovered the enjoyment of life.

April 8, 1968

When I saw Phil today, after about a year and a half, I was, and so was everyone here, amazed at the fact that after all this time, seeing me for the first time since October 1966 he remembered me, remembered the pin prick, tried to interpret it himself, and being a Doctor I took care of him in some way or another and shows a phenomenal memory of certain specific events. This child had come to Linwood in a dilapidated state and has socialized to quite an extent, to the point of behaving at approximately a six-year level where also his learning achievement is at the present time. Resortment of etiology regardless of everything else, this child is, having been rescued from a state of almost vegetation, a likeable retarded child who, if one were to apply numerical terms would rate in about the 50-55 I.Q. level. I say this much because I feel that the child cannot gain more than he has now, he can, but in order to keep myself from indulging in new optimism apart from possibly attainable reality.

Sandy December 12, 1966

Sandy is the third of four children. The second and fourth are said to be healthy and reasonably well adjusted. The oldest brother is also a resident at the Linwood Center and will be seen later in the day.

Unfortunately, at this time we do not have a history of Sandy's early development and know nothing of the early milestones. This will be obtained from the parents because, I think, it is essential for the purpose of evaluation. It is my understanding that Sandy has been at the Center, after some initial day care, as a resident. A thorough physical examination has not been reported from any of the agencies which have been interested in him. I would suggest that this be done, with special emphasis on neurological status and metabolic studies. A PKU test was found to be negative.

Mrs. Nash found him to be functioning at an approximately 2 1/2 year level.

Within the last two or three months, the child has been accessible to some degree of learning. He has learned to spell simple words and has become preoccupied with spelling. He counts up to 6 correctly and then uses numbers indiscriminately. In the educational test consisting of rings of different sizes, he placed them back to make a pyramid and, when he made a mistake, was able to rectify it.

All the while he seemed cheerful and had a facial expression which would not indicate a severe functional retardation. He occasionally answered a question directly but many times he had to be urged by Miss Simons to pay attention to what was said to him.

The parents are themselves people with many peculiarities, each of whom was graduated from college. They are interested in their children to the extent that they have a very orderly household which seems to run a little bit along the lines of meticulousness and just-so-ness. The children are not called by their specified names but referred to as brother and sister.

It obviously has taken the major part of five years before this child could be induced to the limited degree of learning that he is now capable of doing. An adequate diagnosis would depend on a better developmental history and on the results of a good and intensive physical study, as indicated above. We do know that, at least functionally, he is very severely retarded and there is a strong possibility of metabolic involvement.

Now that he has been sufficiently responsive to formal instruction it will be interesting to see what the next few months will bring. Personally, I do not share the optimism expressed at the Linwood Center.

April 22, 1968

One has the right to be greatly encouraged by the progress made by Sandy since seen at the first evaluation in December 1966. Within this year he has emerged sufficiently to be able to start with first-grade learning while a year ago he was rated as having a developmental level of 2 1/2 years. This doesn't necessarily mean a gain of approximately four years in one, it just means that the child is more acceptable to teaching than he was at that time. I regret, that it has been impossible to get the additional information needed; that is, a thorough physical examination and a more detailed report about the early developmental milestones. However, his general demeanor and his typical pin-prick reaction make it more probable, if not certain, that we can now include Sandy is the roster of our autistic children at Linwood. He seems to repeat, more or less, the history of his older brother Allen who is now attending public school and he is dong rather well there. I think that it is quite possible to anticipate a similar development in this child who is making great strides compared to his performance of a year ago.

Tammy October 31, 1966

Tammy is a well-nourished, round-faced, dark-haired little girl who will be eight years old in two months. When she entered the room, accompanied by Miss Simons, she took fleeting notice of the people around, fleetingly acknowledged introductions, disregarded my invitation to shake hands, and at Miss Simons's invitation, sat down in a chair near the table, facing me, though she looked at me only when specifically asked to do so by Miss Simons. Then the eye contact was brief.

She seems to be in good shape physically. She used the right hand most of the time, especially in drawing and handling the toys even though she occasionally used the left hand, especially so when shaking hands at the time of departing. She has adequate coordination.

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Appendix - Part 1

She showed spontaneity only when she asked for objects that she wanted. On those occasions the sentence formation was proper, she used pronouns adequately and there was natural intonation. Things were quite different when questions were asked of her. There was quite a bit of echolalia if she chose to respond to the question at all.

When given a sheet for drawing, she first produced a complete figure which had in it all of the things that usually go into the drawing of a human figure, eyes (with glasses) and nose, and mouth, a short trunk with arms and legs, with attention to hands and feet, but at the lower end of the abdomen she produced another figure which she called "rabbit." The only thing missing were the ears. When asked what that was, she said "double" and proceeded to write some letters, starting with a small "b," which she called "d," and another not identifiable letter next to it. Then at the other corner of the paper, she wrote a capital "J" with a double outline. It is possible that "double" may have indicated the human and rabbit figure combined, but I am not sure if this is a full answer to what she meant when she said "doublt." She then drew and colored a girl (at Miss Simons's request). This was a well-organized drawing again. The girl had quite a bit of hair on both temples and both sides of the forehead. There were buttons on the dress and generally quite a bit of detail. The girl had a large hat around the whole head and face down to the neck. She then drew a boy, which was quite different from the drawing of the girl. Again the ears were missing; the hair was appropriate for a boy's hair-do. While the girl's hat and clothes were yellow, the boy's suit was black. She then spontaneously drew another picture of a girl who was crying. This being Halloween, she gave the girl a pointed head. Tears were coming down from both eyes. When asked why the girl was crying, she said something about going out in the street and then, when asked again, said something that sounded like, "don't throw."

One of the figures she identified as "Joey." There is no Joey at the Linwood Center but she has a brother named Joey.

I asked her if she had any brothers. There was no response but a bit of a mischievous smile. When I asked how many brothers she had, she said, "many." There was no response when asked about sisters, where she lived, where her daddy lived and where her mother was. When Miss Simons asked her who would call for her in the afternoon, there was no response, and this was followed by quite a bit of echolalia.

In her school book, it was evident that she had learned to write nicely and she copied adequately, except that at one time, in a row of several 2's, one was reversed, and on one sheet she wrote October entirely backwards, beginning at the right upper corner of the page.

All during this time she was sitting in her chair and only got up once or twice, pointing to the toys for which she asked.

An airtight diagnostic formulation is not easy. The child's behavior certainly does not present the picture of the so-called brain-damaged or typically hebephrenic child. The pinprick reaction may be considered somewhat equivocal though she did not respond to me in any pleading or angry fashion. She did, however, say "it's hot," thus acknowledging the experience. She does not show the general physical appearance of the typically autistic child. The difference in her spontaneous remarks, properly addressed to Miss Simons when she asked for toys, and her answers to questions is very remarkable as has been mentioned above.

It is reported that this child has shown a bit of compulsive behavior at home, insisting on flushing the toilet after any member of the family has used it and throwing temper tantrums when this was not allowed. There are other similar reports of compulsiveness. It is difficult to say what role her behavior here plays when she has initiated some sex play with other children. Is this another stage in her compulsiveness or what else does it mean? I do not think that we would be too far afield if in view of her compulsiveness, of her good contact with objects and her poor, though graduated, relationship with people, her echolalia or lack of responsiveness whenever questions are asked that come too close to her family, we think of this child as autistic, keeping in mind however her well-organized reproduction of people in her drawings and the remarkable difference between spontaneous communication and response to other people's questions or requests.

On the whole this child has certainly shown considerable improvement. Her latest I.Q. was shown to be 79. Her drawings show a capacity which is not below her age level. She has "learned to learn" as her notebook shows. What the "strephosymbolia" will mean in terms of reading readiness remains to be seen.

April 3, 1968

Tammy, whom I first saw in October 1966, has gained a great deal in ideal aspects. Physically, she has maintained her good nutritional status and appearance of well being. She has responded sufficiently to learn to read and write. She reads at the pre-primer level which is quite behind her general age expectations, but is beginning to show some interest, at least in the level of reading which she is capable of. She responded to the pin prick this time with definite recognition of me as the culprit and was able to tell me off, in no uncertain terms. From the point of view of professional diagnosis I'd say that we might see her as a child who is emerging from a more definite autistic condition and has reached a point where some more emergence can be expected. This child, I think, has gained so much at the Linwood Center that one would recommend continuation here for quite some time.

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Tina October 2, 1967

While this is the first time that I saw Tina for any length of time at Linwood, I had seen her previously, once in my office, once at the Children's Guild, and from time to time fleetingly after her enrollment at Linwood. I remember her as a child who did a great deal of crying which sounded almost inconsolable, and I remember the beautiful work done by Miss Simons in trying to bring about a separation between mother and child. Mrs. F gave me the impression as though she were concerned with the child in utero; I mean by this that you can be interested in and concerned about an infant without having to do anything about it. You carry the child, do everything possible to avoid any danger to the embryo, but you don't have to have any person-to-person contact with it.

This seemed to me to be a continued kind of relationship to Tina after she was born.

When I saw Tina today there was no crying whatever. She was much more of an acting and interacting person than I had known her to be. She showed quite a bit of spontaneity in two ways: she carried out some of the tasks given her, showing good understanding of things said to her and good coordination; handedness (right) is now definitely established. On the other hand, she showed spontaneity in a different direction also: when frustrated, she would stop, turn to something else or just turn her head away. She also showed some of the "negativism" which one finds as a developmental feature in many 2 to 4 year olds. When she succeeded in some of the tasks, she quickly looked up and seemed pleasurably expecting a word or look of approval. It is significant that this 4 1/2 year old child knows colors, identifies numbers up to 10, and places some of them in the correct order. She identified some words, (pig, chair). She enjoyed--and I really mean enjoyed--playing with and catching a ball which was almost a third of her size.

On the whole, this youngster has made remarkable progress and offers a far better prognosis than I would have thought possible a year ago. I think much of her later progress will depend upon her diabetic condition rather than on her psychological development, provided that she can continue in her present setting for quite some time.

June 19, 1968

I first saw Tina when the parents consulted with me with the mother's question as to whether Linwood was the best place for her. Linwood had been recommended by Miss Waskowitz who has given a very good general background in her notes. From all appearances, in terms of the history and in terms of the child's own behavior, it was obvious that this was a child who shows all pecularities of, and particulars of early infantile autism. I have seen the child on and off while she was at the Guild, but always rather in passing.

When I saw her today I could see considerable emergence from the autistic pattern. She eventually made a good relationship with me, but only after many compromises on my part. It was very interesting to see how she made her first approach to me when she went to the blackboard and wrote "Dr." there, and since no one paid any particular attention to her, or knew what she was saying, she made sure that that was "doctor." Later on, she came closer and closer, but only after a time where she would not even turn around to look at me. I understand that she has made one "friend" here, and in conversation, there was always a need for an attempt to make some compromise--at first there was no answer; I asked her for a sister--eventually I learned that she has a sister and her name is Kimmie; eventually I learned that Kimmie was three years old now; but there was always some negotiation necessary to get the response. And she simply enjoyed her negotiations and the eventual coming around.

I would say that this child is very much in the process of emerging from a profound autistic condition. I think the mother will need quite a bit more counseling or guidance in the course of time. Of course, the child also has a diabetic condition for which she is being treated, and as a result of which she once had a coma. There is also the story of Rh incompatibility of the parents; there is a story of a difficult delivery. How all these things fit together and contribute to the picture is difficult to say; but we can say that this child is making progress and has shown considerable emergence from the originally typically autistic picture.

Tod September 19, 1966

Tod is, according to the calendar, six years and nine months old. General longitudinal growth is certainly not in keeping with his age and he gives the impression more of a child between four and, at the utmost, five years. The history indicates that he is the fourth of six children, with no major developmental or behavioral difficulty in the other five. History also reveals lack of maturation in many areas, including motor development. This certainly is not what one finds in children with difficulties that are primarily emotional. Nevertheless, in the approximately one year that he has been at the Linwood Children's Center this child, though still considerably retarded, has gained a great deal in the sense that he has shed many of his compulsions and preoccupations. He certainly does not exhibit the kind of door obsession or the fear of people described on earlier examinations. Mrs. Nash, to whom he has responded well, could not obtain performances which grew above the two and a half year level. He still has not developed definite handedness. In a form board test containing 12 pieces (three each of different shapes and colors), he approaches the test rather promptly and carries it out satisfactorily.

While here, he has developed adequate fecal control, which may or may not have been carried over to the home situation.

He still has a small area, approximately the size of a quarter, of alopecia which, as Dr. Schultz suggests, may be the left-over of a small meningocele.

I certainly would not see this child as a basically schizophrenic, autistic or symbiotic child. There is no question about his retardation, which is spread over several areas: motor, linguistic, adaptive and social. His experiences at Linwood have shown that he is trainable at the motor and adaptive areas, where he has made his greatest gains. The relatively good adjustment of five other children in the family would make me feel that these parents have been reasonably competent five times, and their difficulties in handling this child seem to have arisen more from bewilderment and just by anxiety than from rejection, coldness or any form of non-acceptance. I would help the parents to dismiss any false blame, which they seem to have attached to the child's fall, and encourage them in their acceptance of this child as something which is not man made.

April 1, 1968

Tod whom I saw about a year and a half ago is on the whole a somewhat more comfortable child who nevertheless we can say now is a very markedly retarded child on whatever basis. I doubt whether we can say that this boy, now almost 8 1/2 years old, performs at a level that goes beyond 3 1/2 years and even this is rather an optimistic impression. I understand that it is planned for this child to attend a school, a public school in Prince George's County in a special class for markedly retarded children next September. Tod has had the advantage of spending quite some time at the Linwood Center where he had individual attention and various observations. It is hoped that with the parents' acceptance of the child, he can continue in his family surroundings. I can only say that I wish the present-day public residential placement centers for the markedly retarded child would be able to give the child--any child--the facilities that these children have had at the Linwood Center. But certainly even the Linwood Center with all of its ideal facilities and attitudes of the personnel has not been able to transform this child into something or somebody other than he is and we have concluded that this is, basically, a very markedly retarded child.

CHAPTER 10

APPENDIX

Part 2

Evaluations of Linwood Children by Dr. Leo Kanner
(Follow-up Evaluation)

Art October 24, 1966

This boy, who has recently passed his tenth birthday, is a severely disturbed psychotic child whose psychotic behavior pervades every area of living and is so massive and global that one cannot apply any existing diagnostic categories. One cannot possibly see him as either an autistic or symbiotic child. His explosive behavior and general demeanor comes closest to that which one sometimes finds in the acutest stage of pre-adolescent or adolescent hebephrenic upheavel. He does have speech, which is explosive in character. He has been able, in the interview, to indicate that he knows he will be called for on Friday by his parents.

He accepted some playful contact, seemed to enjoy putting foreheads together, but one had to be on the lookout lest he used some force in the contact. He is a child of considerable physical strength, and of late has changed from self-destructive behavior to one that may become quite dangerous to the other children at Linwood. There were some cases in his behavior when he would carry out the requests, such as handing the scissors to one of the people present, but this is sufficiently stimulating to him to become wild and throw himself on the bed. Even Miss Simons, with all her skill, found it difficult to calm him down on such occasions.

He did put the cylinder blocks in their holes and, without any forwarning, would throw parts of another toy on the floor and then started throwing things generally on the floor. He would, seemingly without noticeable provocation, throw himself on the bed and jump up and down.

If pushed into making a diagnostic pronouncement, I see no other choice than to speak of this child as an utterly unorganized schizophrenic child, using the term in its broadest connotation.

I do not see how this child, with his explosiveness, with his unpredictable behavior, with his great muscular strength could possibly be retained for any length of time at the Linwood Center. He needs a residential setting in which, with the help of potent drugs if necessary, he could be helped to find some peace within himself. I am convinced that his parents also would find some peace for themselves in such an arrangement. He is now 10 years old and no amount of optimism can foresee any degree of social living for him. Unlike most of the children at the Center, he does not offer any lever for therapeutic action.

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Appendix - Part 2

Betty December 12, 1966

This 18 year old girl has been affiliated with the Linwood Center for the past 12 years. She is extremely withdrawn and there is very limited content in her communication or any other relations with people. She has not responded to any encouragement to formal learning. When asked any questions, some of them very simple, she would often repeat the question a few times, not in echolalia fashion, but rather as an avoidance of the necessity to answer. She is physically healthy, rather plump, and walks with a peculiar gait, supposedly caused by flat feet. She does not participate in any of the activities at the Center and is very much to herself, spends her time in the classroom in the flesh but not in the spirit and is often seen mumbling to herself.

Diagnostically she fits better into the picture of "simple deteriorating" schizophrenia than anything else. I do not believe that her continuation at the Linwood Center is warranted. In a State Hospital setting with therapeutic orientation, it might be possible to help her to become a member of the State Hospital community by being helped to learn how to do simple tasks of some usefulness, such as washing dishes, dusting furniture, or--hopefully--setting tables.

Brent October 17, 1966

If one were so inclined, one could build a whole textbook of child psychiatry around the experiences and behavior of this child. Organically, there is the history of a premature rupture of the membrane and a protracted labor, and there is a history of at least one, possibly two, seizures of a convulsive nature. He still, at the age of eight years, has not established definite handedness preference and uses either hand with equal skill.

Emotionally, there is a history of marital difficulties between the parents and, after four months of this child's life, the father stepped out of the picture. The mother is said to be, to say the least, ambivalent about this child and both she and her adopted mother have been to many physicians and a chiropractor in search of one is not sure what.

When the child came to the Linwood Center, he was extremely overactive, described as desttuctive and without direction. When seen today, a number of important features emerged. One is that it was possible for him to sit through about a half hour, remaining practically all the time in his chair, and it was possible to interest him in a number of activities. This could be done only in the way of using visual means. He did not respond to any verbal address, even the calling of his name; however, he promptly and correctly responded to gestures. In this manner he was able to do simple, and even not so simple, jigsaw puzzles with good space orientation. He did these things with some deliberation and not compulsively. Loud clapping of the hands behind him produced no blinking of the eyes. He did b link when the clapping was close to his ear and then, one wonders, if it was a hearing response or one to vibration. There is no question about the fact that this child has a marked hearing deficiency which extends to all kinds of noises and not only to words. In other words, this is a deaf child and not one who suffers from receptive failure alone.

The Linwood atmosphere has been very good for this child in the sense that he has calmed down, apparently is less threatened by people than he must have been, and , if he remained here, it would help him to continue developing a greater sense of comfort. However, this would not answer his educational needs. His progress here has indicated that he is a trainable child and has helped to indicate at the present time that he is also educable if expert attention could be given to his hearing problem. I also feel that, in view of the peculiar home situation, a residential arrangement would be highly desirable. I should think the Central Institute for the Deaf in St. Louis would be an excellent constructive possibility.

Carl December 5, 1966

This 12 1/2 year old physically well-built boy with a handsome physiognomy has been at Linwood Center for approximately 3 years. According to the history, as documented by a pediatrician, he sat up at 7 months, walked at 11 months, and according to the parents said the first words at about 10 months. There is a history of premature rupture of the membrane, of severe colics after birth and of a convulsion, presumably febrile, at 10 months. The history of early toilet-training is not ascertainable. When he was 4 years of age, he witnessed a horrifying scene in which the father pushed the mother into the bathtub and that she sustained multiple fractures, making it necessary for her to be immobilized in a cast.

As seen today, Carl does not exceed the 2 year level of development in any sphere of living. The best he could do was to copy a straight line (with some help), to shake hands at request, to replace the cylinder blocks and, again with considerable help, to do simple jigsaw puzzles. At the same time, looking generally pleased and accepting caressing motions he babbled on, repeating syllables many times and jabbering away--which impressed the parents as "Spanish baby-talk." There is the same type of behavior in his motor performances, making all sorts of repetitious movements of his hands.

It is true that the deterioration set in chronologically at about the same time that he witnessed the father's assault on his mother. However, we cannot get away from the fact that this happened to a 4 year old child whose development was stopped and regressed along the lines of what is observed in Heller's disease. Clinically, this child's behavior is an almost photographic replica of what I have seen in other children with this condition. Only recently has he reduced the frequency of encopresis.

I see not reason for retaining this child at Linwood. Placement at Rosewood State Hospital would be the logical arrangement. In view of the paranoid attitude, I shall refrain from a brain biopsy which,in the instances seen by me and by others, shows a ganglion cell dilapidation and shrinkage of the dendrites in the lower layers of the cortex. Also in view of the father's belligerence, one might present to him the alternatives of Rosewood or Rosewood and keeping the child at home (at least until such a time when the parents themselves will be unable to cope with the situation). Even with the rosiest optimism, I cannot foresee anything but complete social dependence. For all practical purposes, this child functions in the range of idiocy.

Drake December 5, 1966

Drake, approximately 8 1/2 years old, has been at Linwood for about 1 1/2 years. He had been seen by various people from an early age, at first because of what seemed to be inadequate speech development. A neurologist who saw him in New York thought of him as intellectually retarded. This impression was soon discarded and when the family moved to Chicago he was seen for several years at a child development clinic where he was studied thoroughly and many contacts were made with him and his parents.

There has been considerable filling out during the past few months. Mrs. Nash found him to be an intellectually normal child, with an I.Q. of at least 100. He is physically healthy, left-handed and left-eyed. His schoolwork indicates reading and writing ability reasonably commensurate with his age and requirements. While there is mention of ear trouble in early life and a "speech defect," he can communicate verbally except that sometimes at the end of a sentence there is some slurring. This also shows itself on some occasions in his writing when after several words there is some slurring toward the end.

When seen here today he was at first somewhat reticent. He answered questions to the point, told me his age, his birth date, his address, about his brother whose age and grade in school he knew and, once he started going, he volunteered quite a bit of information. He named two children with whom he sometimes played in the neighborhood, spoke of one child who has moved away to Philadelphia, told me that one of the boys at Linwood wanted to be his friend; he readily counted backward from 20 to 1, copied a circle, square and diamond for me, and then volunteered to recite a number of songs for me, telling me that he had learned one of them at the Ethical Culture Sunday School. He told me about trips that he had made with his father and what seemed to be friends of the family.

All during this time, he made peculiar waving hand motions, whirling around on his axis, or hitting himself--not too vigorously--with a rhythmic motion.

He reacted to the pinprick by seeing me definitely as a perpetrator and decided on questioning that I had done that to see if it hurts.

In spite of an elaborate history from the Chicago clinic it is difficult to make sure what kind of role the child played in the home, what the departure from New York, for instance, where they lived (with the grandparents) to Chicago meant to him. David spoke of being teased a great deal by his brother and said somewhat sadly that he does not know how to tease back and that he would like to learn it and might know it when he grows up.

He is now certainly much more reality oriented than he has been, is intelligently communicative, even though this may sometimes be a strain. On one occasion he asked me point-blank whether there was anything more I wanted to say to him. He seemed ready to leave. But when I asked him whether there was anything he wanted to say to me, he remained and continued the interview.

I agree with a statement made previously that this child is not intellectually retarded, not brain-damaged, and not autistic. Nevertheless, his behavior, especially the peculiar motions and whirling, is at times bizarre, less so than it has been when he first came to Linwood. The best I can do diagnostically is to say that--or suggest that here we deal with a schizoid child who has regained and is gaining more contact with people, has given up the fantasies about the imaginary family of 3 (for instance, father, mother, and child) about which he has talked previously and is seeking a relationship with the adults and some of the children at Linwood. He offers a prognosis which is not too gloomy, in fact, I feel that after further reaching out at Linwood, it will be possible for him to be entered in a small school where he can make satisfactory progress in learning as well as in social conduct. This seems to me to be an attainable goal.

Drew November 14, 1966

I have known Drew when he was at the Children's Guild at the age of approximately 3 1/2 years. He was then a markedly withdrawn child who had extremely little contact with the teachers and the other children. In the course of his attendance there, he began to make some slight and fleeting overtures toward one of the teachers. There was hardly any speech except for limited echolalia.

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Drew came to the Linwood Center in January 1964. He is now 7 years and 5 months old. He is a small child for his age, can be said to be attractive physically and certainly does not have the dull expression of a child of his age who on the basis of retardation only tests as low as Drew does. When examined by Mrs. Nash, he did not in any sphere exceed year 3.

When seen today, Drew on entering took barely any notice of the people present and at first did not even immediately go, as many autistic children do, for the objects in the room. He responded to Miss Simons's invitation to draw. In order to assure some degree of responsiveness, Miss Simons made use of his preoccupation with vacuum cleaners, starting a primitive drawing of one. He got the concept but did not accept her invitation to add parts until finally he added a cord.

He then was asked to cut out the completed drawings. He used the scissors impatiently and, again while he got the concept, cut through the drawing and eventually began to tear the paper.

He did not spontaneously do any spinning but did so with pleasure when, after a demonstration, he did spin some round objects.

While he has been ambidextrous for many years, he seems recently to have shown predominant left-handedness.

He reacted to the pinprick in typical autistic fashion, relating himself only to the pin, rubbing the place which had been stuck, but not referring the pricking to the person who pricked him.

There was quite a bit of speech, some of it clearly pronounced, some of it so slurred that he could not be understood. He is capable of sentence formation. In his understandable speech, there was quite a bit of self-admonition. When he got on the bed he said, "off bed." At one time he asked for lunch and when told that this is not lunch time he said, "make it...make it." He spontaneously said, "not going home."

During the process he ran around the room without any particular aim though his excursions sometimes took him to the door. Mere calling him by name did not bring him back; some activity had to be connected with this, and then he sometimes responded and sometimes did not.

In the simple jigsaw puzzles, he put things in the proper space. In the one in which parts of a man are to be put together he was definitely guided by space rather than content. He tried several times to find a space for the man's face anywhere in the puzzle and got it in the right place only when the other pieces were put in and the face seemed to fit in the space.

Prognostically one is entitled to considerable skepticism, especially since Mrs. Nash found no area in which his responses went beyond the middle of the third year. This, however, is somewhat deceptive since it is very difficult to get him to respond to the kind of demands and instructions necessary for the test. He does somewhat, but not very much, better in his spontaneous activities.

When he left, Miss Simons said to him, "Say Goodbye, Dr. Kanner." He said, "Say bye Dr. Kanner."

This last incident is reminiscent of the difficulties which autistic children have in separating parts from the whole. This, as well as his compulsiveness, the difference in his relationship with objects from that with people, the typical pinprick reaction, and the self-admonitions distinguish him sufficiently from the behavior of inherently retarded children of so low I.Q. I should think of this child as a child with the syndrome of early infantile autism, with not too promising an outlook for the future. The parents have modified their behavior but only through direct specific instruction, rather than being able to abstract any meaningful self-readjustment. It is difficult to say to what extent the Rh incompatibility and the early history of diarrhea with high fever have any etiological importance, though one might think certainly of psychological factors that may have played a part, particularly in view of the personality of the parents.

Ed November 7, 1966

This is a seven-year and two months old boy, who originally was admitted to the Linwood Center in June 1964, was withdrawn after about four or five months and returned to Linwood less than a year and a half ago. He and his younger brother, now age six, were abandoned by their mother when Ed was about two years old. She has had no contact with the children since then. The offspring of an alcoholic father and promiscuous mother, she herself had personality difficulties and, though we have no specific details available, it is to be assumed with good reason that this child had little if any maternal affection, especially since his birth was followed in less than a year by that of another child. For this reason we know very little about the early development, even though the father assures us that the early developmental functions progressed adequately. Suffice it to say that, when examined at the Children's Division of the Catholic University, his speech development was minimal and that his general development was estimated at about the 2 1/2 year level. Re-examination by Mrs. Nash in June 1966 showed about the same results, indicating that hardly anything had been added in the intervening 2 to 2 1/2 years.

When the child was seen here today and was brought in with some initial resistance by Miss Simons, she was able to have him sit at the table opposite me. He did get up occasionally without any noticeable purpose but could be returned to the chair. He emitted noises which seemed to express discomfort but it was not the usual crying of a small child. Surprisingly, he showed good space orientation with the cylinder blocks and simple jigsaw puzzles or form boards. He showed definite right-hand preference and only on rare occasions used the left hand when the objects were in easy reach by the left hand. When two sets of cylinder blocks were mixed up, he showed good discrimination, led by a very small difference in color. When given a somewhat more difficult jigsaw puzzle, usually workable at the four-year level, he did not seem frustrated with some of the difficulties which presented themselves and, with some help from Miss Simons, persisted until the whole thing was accomplished.

At times he was able to smile, sometimes a bit mischievously. He had good eye contact. He reacted to pin prick by connecting the source with me as a person rather than with a depersonalized hand.

Speech is still very limited. However, on one occasion when he wanted to leave, he uttered the word, "door." I am told that he could be induced to form an occasional sentence, which he does with a somewhat peculiar intonation.

On the whole, it is difficult to see any area in which he transcends a developmental level of 2 1/2 or, at best, 3 years. He accepts fondling by Miss Simons but there is no sign of reciprocity or cuddling. He initiated some infantile games with her, at which time she had to soothe him, and he seemed to respond to her continued reminder to be gentle. She told us, however, that last week he broke her glasses.

It is amazing that it was possible here to teach him to identify the letters of the alphabet and to match identical letters.

The best thing that we can say diagnostically is that Ed is a severely retarded child with an I.Q. certainly of below 35 at the present time. He has never had a thorough, or even cursory, physical examination. For the sake of completeness and with a possible idea of finding some organic diagnostic clue, I should recommend strongly a neurological work-up and if possible a determination of metabolic functioning.

Regardless of the findings, we cannot prognostically anticipate social participation in a non-residential setting. In view of the limited choices available, I think that plans might be made for admission to the Rosewood State Hospital. It would be kinder to this child to allow him to settle down in such a facility than to continue working for fractional attainments. Whether or not there are any organic causes, we do know that this is a child who has been psychologically deprived from the beginning, that he was abandoned by his mother at an early age, that there was a succession of housekeepers, and that he has had no opportunity to relate himself to anyone accepting adult until he came to Linwood, where on the basis of his background he has found it difficult to proceed from the attention given him other than in the line of fragmentary attainments.

Erik November 21, 1966

Unless you are told so, you can hardly believe that this little homunculus is 10 years and 4 months old. In size and appearance he is closer to a 5 year old, in general demeanor he would hardly be rated as having reached the 3 year level. When he arrived at the Linwood Center about 7 years ago, he was a little something rather than somebody and it is easy to agree with Miss Simons who thought of him at the time as a new born, covered with meconium. During his stay here as a day student, he has acquired adequate sphincter control, still does not use speech except for a kind of sing-song utterance of "Allan," occasionally whines in the manner of an infant and allows himself to be cuddled in a similar manner. He has good psace perception, is able to match a considerable number of geometrical figures, looking over them to find the proper spot.

He is consistently right handed. He understands very simple commands. He reacted to the pinprick without any defensive or offensive movement.

This child is very markedly retarded in his general development and is definitely not autistic or schizophrenic. It cannot possibly be expected that he could ever be fitted in a setting that provides other than, I hope, good custodial care. I agree fully with the efforts planned at Linwood Center to help the parents to look for a good residential placement of this child.

Frank September 26, 1966

This child, who has been at the Linwood Center for more than a year and a half, has shed a great bit of his destructive behavior and joined in the erect posture of the species. While this marks a change from his previous existence, he still presents a picture of extreme aloneness with so much self-capsulation that, when absorbed, he is impervious to sound and sight that is not within the range of his absorption.

This morning was very remarkable in that I had an opportunity to see three children who may be termed autistic, and yet there is such a remarkable heterogeneity of the total picture that they impress one as children who are very different from each other. Frank, at least as he appeared today, offered an impression of the extreme. He, according to observations here, has, within the period of undisturbed observation and after, reached a point when having shed his destructiveness and his porcupine contortions, been able to have, on his good days, some peripheral contact with children and to follow one person around when in need of something.

It is my understanding that the parents, who are cooperative and (pardon my use of the cliche) well- motivated, have a sense of some progress in the child. We certainly cannot present a Pollyannaish prediction, but at the same time it would be inhuman to play Cassandra toward them, and perhaps even toward ourselves. From a purely realistic standpoint, we are far from being entitled to shout "hosanna" when confronted with a child who, at six years of age, is so maximally away from the world in which he lives. But, even though knowing this as an empirical reality, we cannot allow ourselves to capitulate even if it were only for the sake of our peace of mind.

Since this child has responded so little in his ability to be reached, I wonder if it might be worthwhile to see what more intensive operant conditioning may achieve. This is an area in which this method of modification may possibly have something to offer that less mechanized therapy cannot do at the present time.

Gary September 26, 1966

I had an opportunity to see Gary in 1964 when I attended the Children's Guild for a period of time. When he entered the Guild it is not an exaggeration to say that outwardly Gary seemed to be merely vegetating. At that time he would tolerate no physical contact with people. There was no eye contact and he was impervious to any kind of verbal approach. A nurse from the University of Maryland, who spent some time at the Guild, took Gary over as her assignment. It took some time before she could win him over to the extent of letting her carry him around even though at times he would slip out and run to the corner of the play yard and try, to the extent possible, to hide in the hedge. On those occasions he stood stock still and it was obvious that he sought comfort in his complete isolation. The awareness of other children went only so far as staying away from them. The nurse was able at least to give him the feeling of wanting to be with her, and at times he would adjust to her embrace in the manner done by an infant a few months old.

When I saw him today, he was both the same and a different Gary. He still ran out a few times but this time this act was more of an invitation to be brought back rather than a mere escape to aloneness. There was "method in his madness." He still had a typical reaction to pinprick and yet I felt that somehow it was not entirely depersonalized.

I notice that he has now achieved definite right handed tendencies. He has adequate fecal control. He is still, with one or two brief one-word exceptions, not a speaking child. However, he is a communicating child. Instead of being completely away from people, he invites and enjoys playful physical contact and flories in his own spontaneous physical romping.

From a diagnostic point of view, even though there is not too much of "a desire for the preservation of sameness," this child responds to the criteria of early infantile autism. He certainly has shown emergence from what I would not hesitate to call absolute isolation and has reached a point when people are no longer as threatening as they must have been. He even is able to go through motions of stroking cheeks with what seems to be an attitude not devoid of fondness. Since he is now showing a capability for imitation of sounds, I wonder whether this could not be used playfully for the introduction of, and repetition of, syllables with varying consonants. This would best be done in as playful a manner as the physical activities with him. In his motor development, he now has taken an interest in cutting and scribbling. This, and his general behavior, indicates good coordination, at least in the finer motor activities.

If any sorting out of diagnostic categories at Linwood should be decided on, I would not hesitate to consider this child among the group of autistic children.

Gene November 28, 1966

This well-nourished, somewhat pasty-looking almost 9 year old boy has been at the Linwood Center since June 1962. He was variously diagnosed as having central hearing loss and receptive aphasia. He has been in residential care at Linwood. His parents preferred this so that they could give sufficient attention to subsequent children, Gene being the oldest. However, they are sufficiently interested to look for further possibilities for this child.

In the interview, it is very obvious that this child does not respond to the spoken word, but obedianetly, and sometimes almost with automatic obedience, responds to gestural invitations to sit up, walk to the door, hand me certain things. When invited verbally, there is no reaction and no facial sign of comprehension. He has fair space perception and did a rather complex jigsaw puzzle, being guided chiefly by space and somewhat by content. When frustrated, he performs some peculiar finger motions. He is persistent in his performances and shows some facial anger when interfered with.

This child is at Linwood only because there is no place available for a combination of satisfying emotional needs and at the same time giving him the specialized help which he needs for his aphasic condition. I still like the old term congenital word deafness better than aphasia, which in the course of time has been given so many different meanings. This child must have given up a long time ago. I know such children who, no matter how frustrated otherwise, would eagerly look at other people for gestural communications. This child no longer does that and, in fact, must be touched bodily in order to invite him by gestures to do something. In his work he is quite methodical and, when leafing through a telephone book, would not leave it until he closed the book. I wonder if something can be done to help this child through the Spencer Tracy Foundation. If he does not get help soon, I think the prognosis is bleak, and I hope that it is not too late by now.

Glenn December 7, 1966

This is an 8 1/2 year old child in apparently good physical condition, with reasonably good motor coordination. Handedness is not as yet fully established. There was, during the entire period of examination, no verbal response either spontaneously or in answer to questions, and there was quite a bit of squealing, which seemed pleasurable to him. In the formal tests given him, he rates at about 2 to 3 years. He is not entirely unresponsive, was able to hand objects to people designated to him and to retrieve those objects . He did the cylinder blocks and the simple form boards and was rather concerned when a form did not fit exactly into the hole, needing some reassurance that this was as it should be. There was some repetitiousness in the performance, which one may or may not designate as perseverence.

It is difficult to put this child into a definite diagnostic category. He is obviously retarded in his general functions. While there is no question about this, the question of etiology is not as easily answered. It so happened that I had an opportunity to see the father, and it seems that there was a definite withdrawal and regression at the age of about three when the family moved back from France to this country. Still, in view of this child's beginning relationships with people, however limited, in view of the fact that with occasional exceptions he has retained sphincter control, also in view of the imitative quality of some of his behaviors (he is even said to have made consumable muffins at home), his development does not fit in with Heller's Disease, of which one might think at first. In looking over all the possible and available diagnostic formulations, this picture comes more closely to schizophrenic withdrawal than anything else one can think of.

If one considers the progress that the child has made here--and this is small progress to be sure--it is still very questionable whether this child can reach a level of independent social functioning within the foreseeable future. However, it is possible to think that, with another year or two at the Linwood Center, he may reach a stage when he could be helped to fit into a school group geared to the so-called trainable retarded child, such as the Search Light School or the School of Chimes. The father seems to be quite aware of the child's limitations. I think he is now well prepared for good cooperation with the Center and will be more cooperative than the parents have been previously. The child's younger brother, now six years old, also has some difficulties of a nature which is not easy to determine but he is followed at the University of Maryland, and a report from them might help us to round out the family picture.

Greer October 19, 1966

The major part of the 10 1/2 years of this child's life has gone into intensive effort in several quarters to establish a diagnostic basis for his handicap as a framework for remedial activities. Purely an impression of schizophrenia has remained on the books so far. At the same time, we have the information that he did not walk until the age of 22 months and that sphincter control has not been fully established to this day. No objective physiomethod evaluation has ever been able to find any area of performance which goes beyond that accomplished by an average 2 1/2 to 3 year old. There is no question about his ability to hear, and he comprehends the spoken word if it is within the limits of his intellectual level. He promptly at request sits down, hands me an object (Provided that he understands the name of the object) blows a match; even on one occasion fetched for me an educational toy (indicated as "that thing") from the mantle. He had, on the whole, good eye contact when he felt like looking at somebody. On one occasion he took me by the hand and led me to a bed where he lay down, inviting play of the order of tickling and enjoyed it thoroughly.

In the pinprick test situation, he definitely reacted to me as a person.

At 10 1/2 years of age he still has not developed handedness preference. When an object is at his left, he reaches for it with the left hand and vice versa.

It would be stretching the concept of schizophrenia extremely far if we were to consider this boy a schizophrenic. There is no oasis, no performance that goes beyond, at best, a three year level. There is also no indication of any kind of catatonic, hebephrenic, delusional or hallucinatory content.

I understand that he has shown some limited positive response in operant conditioning experiments, but would not a retarded child show an equally limited response? Unless anything to the contrary could be demonstrated, I am convinced that these responses do not transcend the

2 to 3 year level of behavior. I have no doubt that continued effort of this kind may result in further additions of fragments within the same level, but would this warrant a general overall prognostic optimism? Would, in view of the excellent facilities at Linwood, the efforts expended be more warranted for children with different outlook? After a considerable period of individual therapy, after efforts at Hillcrest and at Linwood, we find, through little fault of theirs or his, a picture which in no way has changed this child's status. We ought to have the courage of reality and gently, sympathetically, lead the family to the recognition of things as they are and suggest an extended residential placement.

Rod June 17, 1968

Rod whom I saw in October 1967 for a preliminary examination prior to admission, was not enrolled in Linwood until the end of April, and therefore has been here for only a short time. During this time it was possible, however, to crystallize the diagnostic impression, and there certainly is the self-isolation and the compulsiveness which was evident the first time. I'm more sure than ever now that we deal here diagnostically with an autistic child with all the attributes of the characteristically autistic child, even to the point of the self-adminitions that one finds often in these children. He responds only to the extent of his own preoccupations and is unresponsive to anything else, and becomes impatient and sometimes very vigorously impatient with interferences. At the same time he has somehow acquired the ability to print all the letters of the alphabet; he knows numbers even to the extent of telling them copies backwards. I think that prognostically this child reminds me of the children who had very similar behavior patterns and at the same time had learned some of the routine things in terms of reading, spelling, and numbers, which means that with a prolonged sojourn at the Linwood school, I can foresee continued improvement after an initial struggle to help him to feel less resistive to interference.

Sally October 9, 1967

This approximately 5 1/2 year old girl who has a history of seemingly adequate development for the first 16 months is reported to have regressed considerably. She was found to be markedly retarded and regressed with some pseudo autistic features at the Children's Center at the age of about 3 years. She was enrolled at Linwood last June.

When I saw her today (after a very brief encounter a week ago) she had contact, however, tenuous, with people, and seemed to have a need for direct communication. Pointing to the toys on the mantle she could say, "Get that," or "I want that;" she could point to persons saying, "Look at that." She was for a while preoccupied with bees, identifying some flowers on an upholstered stool as bees. When I stung her with a pin she maintained the connection with bees.

All the while she was smiling rather vivacious through there was on the whole little change in her mood which makes one wonder how genuine the smiling was and how immediately connected with the experience of the moment.

I would be at a loss if I were pushed into a corner to utter some words of diagnostic wisdom. I can say that this is not a typically or even atypically autistic child. I am certain that the present beginnings of emergence preclude any thought of Heller's Disease. She is functionally retarded but shows signs of at least what is presently termed trainable potentiality. She has recently responded to toilet training, feeds herself adequately, and shows some aggression toward other children. She does not show any typically signs of any of the metabolic disorders that have been described. This is one of those few instances in which one has to fall back on Beata Rank's designation of the atypical child.